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Contraction in Iron and Steel

Less at Steel Works Than at Blast Furnaces

Nearly 20 Per Cent. Curtailment in Pig Iron Since February—A 1.40c. Basis for Steel Bars

The blast furnace statistics for August 1 show plainly the contraction that is going on in the iron trade. In July, the production of coke and anthracite iron was 2,142,442 tons, or a daily rate of 69,111 tons, as against 2,265,478 tons in June, representing a daily rate of 75,516 tons. The falling off is chiefly in the output of steel works blast furnaces, their production being 4500 tons a day less in July than in June.

It should be noted, however, that steel production has not declined in the same ratio as that of pig iron, since the large steel producers are now drawing upon their stocks of pig iron and scrap. These have grown in recent weeks and the accumulation has been accentuated by an increase in stocks at merchant furnaces producing steel making iron. In the Mahoning and Shenango Valleys there was a very considerable increase in stocks of Bessemer and basic iron in July.

The United States Steel Corporation is now operating 72.5 per cent. of its blast furnace capacity, having 39 furnaces out of blast, as against 35 furnaces July 1 and 31 furnaces June 1.

With 256 coke and anthracite furnaces in blast August 1, or 57 less than on February 1, the country was producing pig iron at the rate of 25,500,000 tons, or nearly 20 per cent. less than the maximum rate of the year, which was reached in February. The present rate is less than that of 1907 or 1909.

In the past week there have been evidences of rather more pressure on foundry iron prices. A number of sellers have been more actively seeking business and \$11, Birmingham, for No. 2 Southern iron is now not uncommon. In the East, Virginia iron has been sold as low as \$13, at furnace. Most buyers are willing to wait longer, though the low priced business that has been done lately, particularly in Southern iron, is probably underestimated.

Bessemer and basic iron under the weight of large stocks have declined to \$15.25 and \$14.25, respectively, at Valley furnace. The widely reported sale of 10,000 tons of basic iron at \$14, at furnace, is regarded as speculative and was for cash.

The lower prices for billets and sheet bars have attracted some consumers. One sheet bar contract is reported, covering the balance of the year, at close to \$25.50, Pittsburgh, and a tin plate manufacturer has bought his supply of tin bars for this year on a sliding scale governed by average monthly prices of Bessemer pig iron.

The making of Chicago district prices on forging billets, without regard to the Pittsburgh price plus freight, marks further progress toward an independent Chicago basis on all steel products.

New business has come to the books of the large steel companies at a less rate in July than in June.

Rails have been the least active line. Further important rail orders are not now to be expected for rolling in 1910, and the mills have not formally opened their books for 1911.

Heavy products have been less active as a rule than the lighter. Several plate mills have little work ahead. The Riter-Conley Mfg. Company has taken 2½ to 3 miles of riveted pipe work for New York City, and the plates will be rolled at Pittsburgh. The Texas Company is expected to buy 60 to 75 miles of 3 to 8 in. line pipe this week.

The sheet trade has been somewhat unsettled by low prices, and 2.20c., Pittsburgh, for No. 28 black for the remainder of the year has been reported. Recently rather better business has been done by some mills.

Sales of wire products by the leading interest averaged about 7300 tons a day in July, the total making a new July record. The reduction in prices also stimulated specifications which were at the rate of 4600 tons a day.

The 1.40c. price for steel bars, which was made on agricultural contract business some time ago, and on contract business of other descriptions in the past month, is now more common. However, on early deliveries, 1.45c. still generally prevails.

The larger fabricating works have contracts on hand that will occupy them well toward the end of the year. July was a light month for new business, however, the total being about 100,000 tons, of which the largest producer took 30,000 tons.

Two Iron Trade Readjustments

The iron trade of 1910, in disappointing the high hopes entertained at the beginning of the year, has furnished support for the view of some students of financial and industrial movements who said last year that the recovery of 1909 was too rapid to be lasting. One year ago when market reports were noting each week the rising tide in iron and steel, these commentators were finding a parallel between 1895 and 1909 and suggesting that the revival then attracting so much attention might be followed in 1910 by reaction. It was pointed out in reply, and truly, that conditions in the two years were widely different. The unsoundness of our currency basis then and the menace of free silver, which in the Presidential campaign of 1896 brought the country close to financial calamity and chaos, were palpably in contrast with the thorough establishment of the gold basis of to-day. The poverty of Western farmers then and their close approach to opulence in recent years also furnished the strongest ground for distrusting the parallel, not to mention other differences, including the country's enormous increase in wealth since 1895, its sounder credit basis and the general prevalence of confidence in its financial institutions.

As the fall months of 1909 came on and pig iron production rapidly increased, while prices continued to advance, it was recalled that the boom of 1895 began to wane in the fall of that year, and again the attempt to draw a parallel seemed to break down. Early in 1910 the statistics of pig iron production appeared, showing that 1909 had made a new record and that in the second six months of the year the greatest previous half year's production—13,478,044 tons in the first half

of 1907—had been exceeded by 1,300,000 tons. And now that the first half of 1910 has shown an increase of 240,000 tons in pig iron production over the last half of 1909, whereas in the first six months of 1896 there was a decline of 7 per cent. from the previous six months, it is evident that the movement of 1909 in the iron trade was far more substantially backed than the short lived boom of 1895.

Those who would emphasize the resemblance between business conditions in the two periods mentioned, in spite of the contrasts, including the fact that the reaction has been much later in coming this time and thus far more gradual, will be interested in the following table of pig iron production for 1895 and 1896 and for 1909 and 1910:

Pig Iron Production in 1895, 1896, 1909 and 1910—Gross Tons.

| | First half. | Second half | Total. |
|-----------|-------------|-------------|------------|
| 1895..... | 4,087,558 | 5,358,750 | 9,446,308 |
| 1896..... | 4,976,236 | 3,646,891 | 8,623,127 |
| 1909..... | 11,022,346 | 14,773,125 | 25,795,471 |
| 1910..... | 15,012,392 | ..... | ..... |

Noteworthy parallels in the statistics are the increase in pig iron production in the second half of 1895 and the second half of 1909 over the first half of those two years, respectively. It was close to one-third in each case—31 per cent. in the former and 34 per cent. in the latter. Further, both years established a new pig iron record, 1895 exceeding 1890 by 240,000 tons, while 1909 exceeded 1907 by 14,000 tons. What the last five months of this year will determine is the extent to which the decline in the second half of 1910 will parallel that of the last half of 1896.

It is true that the specter of free silver is not now stalking abroad as in 1896; but instead of the doubt then prevalent as to the currency basis we have now, in the pending anti-trust cases, uncertainty as to the basis of business organization and further uncertainty as to railroad security values and earning power, due to the clouding of the whole question of rates for transportation. We have been told for many months now that underlying conditions are sound—a somewhat hazy way of saying that the financial structure is not endangered by serious credit abuses or by extended speculation. Perhaps the expression is intended to emphasize the difference between business conditions to-day and those of the years following the panic of 1893, including the very years to which reference is made above. Nevertheless, the view finds strong support that so far as real readjustment is concerned the work following the panic of 1907 was by no means what was looked for. One view of the process of sifting which is now under way is that it will eventually accomplish what was left undone in the recent depression, and there are those who see ahead a general readjustment of commodity prices and labor and who believe that there must be a period of economy and thrift before our available capital can be increased so that we can safely go ahead on a larger scale. Such a view will be combated by those who are always persuaded that the interruptions to prosperity are fortuitous, and that but for politics or mistaken or dishonest banking, or poor crops or unfortunate speculation there need be no serious fluctuations. Yet there is no mistaking the fact that a certain shrinkage is now going on in the volume of business. It has been accompanied by no spectacular happenings and there is widespread confidence that it will result in healthier conditions, with prices on a level that will eventually

broaden consumption. One thing that will count for an orderly readjustment, without violent disturbance, is the abundant attention given for months to every possible menace to business and the fact that capital, with the possible exception of one conspicuous line, has been unwilling to venture upon large extensions.

Utilizing Idle Helpers

A correspondent asks for assistance in solving the problem of the utilization of helpers in a manufacturing plant during such time as they are not needed in their regular employment, his statement of the case being as follows:

In our press shop we have a large number of helpers. As some press jobs are more difficult and require more handling than others, there are times when we need all the men we can get. But as these conditions are constantly changing, say, up to four times a day, you can readily see that there will be frequent intervals when a helper will have nothing to do. At these times he keeps busy and out of the foreman's sight by doing work that there is no need of his touching. Of course, this shoots up the costs on jobs to which such helpers charge their loafing time. The problem is. What shall we do with our helpers when we do not need them for half an hour or a day? We make stampings and do light and heavy drawing, hardening, annealing, plating and forging and solicit jobbing work.

A shop I know of uses a large number of castings. When helpers are not busy they are sent to a big work bench in the center of the shop, where they clean castings and smooth them up with brushes and cold chisels. Their time is charged to the job that the castings are intended for. Having gone over the details of our press work I can find no job that will correspond with these castings. If I want to use the work bench plan I might introduce some by-product. Could you suggest anything that would fill the want and still be simple enough for our men to handle?

The problem is one that has to be solved in many plants. In some cases, such as that last cited by our correspondent, it is an easy one. In others, it resolves itself into a matter of equipment. To illustrate the point, presuming that the wasted time of helpers averages to equal one man for a full year, with a dead loss of \$500 in wages, the owner might very well consider an investment in new equipment for the conversion of a waste into a producing force. The factory in question makes staple lines and probably special pressed metal parts on contract in large quantities. Some of these goods could be produced at odd times by unskilled men, if a press, or several, were kept set up for the purpose. Such equipment should be in addition, to machines which are constantly employed. They would be reckoned into the manufacturing facilities, but with the understanding that they would be out of commission at intervals. This would constitute a loss of interest on its cost, but against it would be the saving of idle time of workmen. The expenditure of \$500 annually is 5 per cent. on an investment of \$10,000. The tying up of, say, \$1000 in a press is small indeed when compared with such a leakage. If the machine should remain unused for half of the year the economy would still be large. It should be set up for a year's supply of some standard article, or on a large contract for a customer, such as a pressed steel company has constantly on its books. Ferrules and ball bearings and stove knobs are manufactured in large lots in standard and special forms. An economy exists in completing press jobs on one setting of tools, for diemakers' time is valuable. Money is tied up to some extent, but manufacturing is cheaper. This is the policy of the more progressive of the automobile builders; they are lavish in their equipment, one important reason being the conservation of labor.

In case this solution of the problem is impossible, the wasted effort of the helpers should not be charged up to any one job, but to the account of non-productive labor, for the cost should be distributed in the overhead expense. Otherwise a fictitious cost will be saddled upon some order, which is misleading, and may even be demoralizing in its effect. With a comprehensive cost system, however, if a workmen must have a job ticket in order to be credited with his time, it would seem an easy matter to correct a tendency to keep out of a foreman's sight and still have the opportunity to labor. The foreman assigns each task. The payroll is made up from the tickets turned in by the men. It should not be forgotten that helpers can do much of the non-productive labor of a manufacturing establishment, including the sweeping and cleaning. Above all, it is important to retain efficient helpers, even if some of their time is valueless to the employer. The fact should never be lost sight of that it costs money to break in new men. Not only is their own time lacking in efficiency during the early days of their employment, but they require the time of well paid men who should be using it to better advantage elsewhere. Should it be necessary to seek outside work for the special purpose of giving employment to the helpers, a careful scrutiny of neighboring works may reveal the desired chance.

The Automobile Industry

Two widely different aspects of the automobile industry have presented themselves within the past two weeks. One of these is the exceedingly prosperous condition of certain automobile companies, as shown by the declaration by the Chalmers Motor Company of a cash dividend of 30 per cent. and a stock dividend of 1000 per cent. and by the notification of the General Motors Company to its stockholders that it will shortly declare a stock dividend of about 500 per cent. These two companies have probably made larger profits in the past year than others in the same line, but undoubtedly the entire industry has fared exceedingly well until quite recently.

Another picture is now presented. Indications are unmistakable of a slowing down in the demand for automobiles. It is announced on good authority that several makers of lower-priced cars have begun to accumulate stocks. Already some of the Western manufacturers have made arrangements to curtail their production heavily for the remainder of this season. Makers of automobile parts have been hit hard. A company whose principal product is automobile castings had 1100 men at work a few months ago, but now is able to employ a force of only 400.

Out of this development it is likely that more healthy conditions will be established. The automobile industry has been marvelous in its growth, when the fact is considered that a motor car is an article of luxury and its use is only available by a limited number of persons in any community. Nevertheless, the demand for motor cars for pleasure has grown by leaps and bounds, the volume of business up to this time having been uninfluenced by the condition of general trade. The great increase in the demand had to be met by the efforts of automobile manufacturers, and they continued expanding the productive capacity of their plants for the purpose of being able to make

shipments desired. It seems probable that, having caught up to the demand, the business will hereafter be more amenable to general conditions. When prosperity prevails more automobiles will be bought and used, but when depression sets in the automobile business will slacken as do other lines of trade.

The Non-Cancellation Campaign

The National Machine Tool Builders' Association is pushing with much vigor its campaign to secure the adoption of the principle of non-cancellation of orders. The movement will have the active co-operation of the dealers. No reasonable argument has been advanced against the change. While no one anticipates that the reform of so long standing an abuse can immediately be accomplished, the manufacturers can make the beginning from which it should be a matter of no great time to establish the new custom. Some dealers object to taking a conspicuous position during the initial stages of the effort, because of their intimate business relations with certain of their customers. Every house has its own particular buyers to whom favors must be accorded. The right to cancel orders has been one of these; the understanding has always existed that such is the case, except with machines which are special in their nature. The dealer feels that should he wish to release a customer from a contract which the latter desires to cancel, because of some change in conditions, he should have the right to do so for the present. He would like to have the manufacturers make a beginning by the creation of a rule that all orders must be considered as binding contracts, not subject to cancellation. With this information in his possession the dealer would be at a great advantage in his relations with his customers. His explanation of the changed conditions in his own dealings as a middleman with the manufacturers would have a strong influence in creating the beginning of the new order of affairs, and the trade would be placed on the new basis in a comparatively short time.

The dealers desire the change for other reasons which are peculiar to their own establishments. In not infrequent cases salesmen secure orders with the understanding, unknown to the management, that cancellation may follow, if later on the buyer decides that the machinery will not be needed. Another important element is the effect of the non-cancellation rule on the crafty buyer who safeguards against possible needs of equipment by placing orders, knowing very well that the chances are good that he will not take the tools. Some salesmen encourage this practice, "fattening up" their current business, with the chance of making an actual delivery later.

As has been stated many times, the machine tool industry is at a disadvantage in its trade as compared with other lines of machinery and equipment. The argument is made that contracts for heavy tools should be framed along lines similar to those of the engine builders, who require one payment with the order, another when the machine is on the premises of the customer and a final settlement when the engine is accepted. The contract is a fair one, and the same conditions confront the builder of heavy machine tool equipment.

Regarded from every side, including that of the customer, the effort of the National Machine Tool Build-

ers' Association is logical. In common with every other radical change in industrial conditions, criticism and complaint will be heard, but, as always where a cause is just, the community will soon adapt itself to the new conditions and will forget that they have not always existed.

Correspondence

Blast Furnace Results with Natural Air

To the Editor: It will not be necessary to wait until the end of next September in order to give the data requested by "J. J. S." in his letter published on page 128 of *The Iron Age* for July 21, 1910, relating to the good results secured with natural air blast at the East furnace of the Columbus Iron & Steel Company. By giving the data for July, August and September of 1909 and April, May and June, of 1910, the whole year will be included and the six months of spring and summer can be compared with the autumn and winter months. The facts regarding the work of East furnace for the 12 months ending June 30, 1910, are as follows:

The average coke per ton of pig iron (2268 lb.) for the six months ending March 31 was 1977 lb. The average coke per ton of pig iron for the months of July, August and September, 1909, and April, May and June, 1910, was 2085 lb., and the average for the entire year was 2031 lb. Therefore the increase for the summer months was only 108 lb., instead of the 300 lb. predicted by "J. J. S." Part of this increase was due to the fact that 38 per cent. of the product for July was foundry iron (all the rest was basic), and part of the increase was due to bad coke used in September and April when cold ovens were being started.

The East furnace is a merchant furnace, and in times like the present all its product must be well within the limits. A steel works furnace is not thus handicapped in its tonnage figures. R. H. SWEETSER.

COLUMBUS, OHIO, July 27, 1910.

Land and Irrigation Show at Pittsburgh.—Extensive preparations are being made for the mammoth land show to be held October 17 to 29 in Pittsburgh, Pa. The show will be known as the National Land and Irrigation Exposition, and will consist of United States Government exhibits and special models of irrigation and drainage systems sent in by the various State immigration boards and chambers of commerce of the country. The object of the exposition is to provide for the homeseeker, the farmer, manufacturer and investor authentic and graphic information regarding land openings and possibilities throughout the entire country, and to show samples of the mineral, agricultural and horticultural products of the various sections represented. Many interesting exhibits are being arranged for, and a large attendance is expected.

The Bethlehem Steel Company's Half Year.—The six months' statement of net earnings of the Bethlehem Steel Company, just issued, \$1,161,930, is the most favorable of any like period for five years. The total income showed a gain compared with the first half of 1909 of \$654,982. With an increase in interest charges of \$96,754, there remained an increase of \$558,227 as net available for dividends. The company's plants are running at full capacity, and orders on the books of the structural mills bid fair to insure operation at full capacity for at least the remainder of the year. A favorable feature is the more active operation of the ordnance plants as a result of the \$10,000,000 contract in connection with the two battle-ships being constructed for the Argentine navy in this country.

The Mechanical Engineers En Voyage

BIRMINGHAM, ENGLAND, July 25, 1910.—A list of those representing the American Society of Mechanical Engineers who would attend the joint meeting with the Institution of Mechanical Engineers in England was printed in *The Iron Age* of June 14. The party which sailed on the Celtic of the White Star Line arrived in Liverpool the evening of July 24, and the next forenoon took a special train to Birmingham, where the first sessions were held. The trip across the Atlantic was one that will be long remembered by those who were of the party, for the weather was especially favorable, the programme of entertainment exceedingly attractive, and the opportunity to make new friends and become better acquainted with old ones unusual even on shipboard.

The Entertainment Committee, headed by George M. Brill of Chicago, earned and received the gratitude of all for the extensive preparations made for the occasion. The society's party constituted the majority of the first cabin passengers, but all were included in the invitations to participate in the games and evening functions, and it proved mutually agreeable.

Monday evening the officers and past presidents of the society and the ship's principal officers held a reception on the boat deck followed by a dance. Tuesday evening, Past President Worcester R. Warner gave an illustrated address on "What Are the Astronomers Doing?" showing a number of splendid photographs of the moon and planets and views of the Lick and Yerkes telescopes, both of which were built by Warner & Swasey, Cleveland, Ohio. Wednesday evening there was an enjoyable informal musicale of passenger talent. Thursday evening Past President John R. Freeman, one of those on the last commission sent with then President-Elect Taft to inspect and report on the work at the Isthmus, gave an illustrated address on "The Construction of the Panama Canal."

Friday evening a dance was held, and Saturday evening the concluding entertainment and the awarding of prizes for games won during the week—bridge whist, shuffle board tournament, potato races, &c. Prof. F. R. Hutton presided, and introduced the performers in what amounted to an amateur vaudeville show. Past President James M. Dodge proved the headliner. He was scheduled for a lecture, "An Exhaustive Review of the Formation of the Earth and Its Oceans, with Some Conclusive Educational Remarks on the Solar System and Prognostications on the Ultimate End of the Universe," in which he was assumed to controvert the theories of all other scientists. A jury to sit in judgment on his arguments solemnly filed in and took its position before him, impressively gowned in ladies' kimonos of varied hues. The jury was composed of Ambrose Swasey, chairman of the Committee of Arrangements for the trip; John R. Freeman, William H. Wiley, Oberlin Smith, Jesse M. Smith, George M. Brill, Calvin W. Rice, H. L. Gantt, Prof. W. F. M. Goss, Prof. Arthur M. Greene, Jr., James Hartness and F. H. Stillman. While pretending to lead up to his subject, the speaker deftly avoided it by repeatedly digressing in the telling of dialect stories, and his Irish, French and German impersonations would have done credit to a professional. A poem, "What's the Use?" referring to all kinds of engineering activity, by G. T. Whitney, superintendent of the Detroit Iron & Steel Company, was read by A. T. Baldwin, and Professor Hutton concluded the evening with a collection of limericks apropos of the voyage and a little personal at times.

Several of the party disembarked at Queenstown and Holland, but the majority continued on to Liverpool, and before landing were met by representatives of the Institution of Mechanical Engineers and John

Lea as a deputy of the Lord Mayor of Liverpool. The latter extended a welcome to the visitors for that city, and President J. A. F. Aspinall of the institution welcomed them generally to the meetings, seconded by Professor Watkinson of the Liverpool University. Prof. W. F. M. Goss, Sr., vice-president present, responded for the American Society.

In Birmingham the party was met by other representatives of the institution and several earlier arrivals of its own society, and at the time of the sending of this communication is preparing to enjoy the elaborate instructive and delightful programme of papers, excursions, &c., which awaits it and was outlined in a previous issue.

H. R. C.

Gary Sheet Mill Contract Placed

PITTSBURGH, PA., August 3, 1910.—(By Telegraph.)—The American Sheet & Tin Plate Company, Pittsburgh, has awarded a contract to the William Tod Company, Youngstown, Ohio, for 16 sheet and 4 jobbing mills for the new sheet and tin plate plant to be erected at Gary, Ind. The contract for the castings for these mills has been placed with the Wheeling Mold & Foundry Company, Wheeling, W. Va. Further contracts for machinery and other equipment will be awarded by the American Sheet & Tin Plate Company in a short time. The American Bridge Company has had the steel buildings to contain these mills under erection for some months, and they are pretty well on toward completion. The foundations for the mill buildings were built by the Raymond Concrete Pile Company, New York and Chicago.

The William Tod Company has also received a contract from the Republic Iron & Steel Company for tables and transfers for the new 40-in. blooming mill to be installed in its open hearth steel plant now being built at Haselton, Ohio.

Westinghouse Foundry Concentration

A tract of land comprising 70 acres adjoining the property owned by the Westinghouse Machine Company has been bought at Trafford City, Pa., by the Westinghouse Electric & Mfg. Company for the purpose of erecting a large foundry. The purchase of the ground involves an expenditure, it is said, of about \$250,000. The foundry will be one of the largest of its kind in the world, and 2500 men will be employed.

When the plant is completed the Cleveland foundry belonging to the same company and the one on the north side of Pittsburgh will be centralized at the new location, and thus place all of the foundries of the Westinghouse interests in one town, making great economies possible and reducing the cost of shipment of castings to a minimum. The site has already been connected with the Westinghouse Electric and Westinghouse Machine Company plants by what is known as the Interworks Railroad.

The Alan Wood Iron & Steel Company, Philadelphia, Pa., resumed operations on Monday at its Ivy Rock plant. Extensive repairs and alterations have been made, particularly in the open hearth steel department, the furnaces in which have been prepared to use hot metal, which will later be supplied from the company's Swede furnaces. Four open hearth furnaces are in operation, and others will be put in as fast as possible. The rolling mill is now running at full capacity.

The first passenger train passed through the Michigan Central Railroad tunnel under the Detroit River July 27. The tunnel will probably be completed by October 1, and trains will then run regularly.

Pig Iron Production

A Sharp Falling Off in July

**Active Capacity August 1 Was 1,600,000 Tons
a Year Less Than on July 1**

Returns which have come with unusual promptness from the blast furnace companies show a production of 2,142,442 gross tons of coke and anthracite pig iron in July, a very considerable reduction from that of June, which was 2,265,478 tons. The falling off becomes more marked in comparing the daily rate (June being a short month), which was 69,111 tons, against 75,516 tons in June. The number of furnaces in blast was reduced by 12 in July, being 256 August 1, against 268 July 1. From the maximum of 313 on February 1, six months ago, the net reduction has now been 57.

The July output has shrunk more than is indicated by the number of furnaces going out, as there has been slower working of a good many furnaces to avoid piling iron. The Chicago district shows the heaviest curtailment, the output there for July being nearly 20 per cent. less than in the 30 days of June. Our figures show that the 256 furnaces in blast August 1 had a daily capacity of 68,768 tons, which is 4500 tons a day less than the figure for July 1, or at a yearly rate over 1,600,000 tons less than that of a month ago.

Production is now at the rate of about 25,500,000 tons a year, or less than the respective outputs of 1907 and 1909. From the high rate reached in February, which was 31,650,000 tons a year, output has now been cut down about 20 per cent.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with July, 1909, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

| | Steel works. | Merchant. | Total. |
|--------------------|--------------|-----------|--------|
| July, 1909..... | 48,670 | 19,123 | 67,793 |
| August..... | 51,354 | 21,192 | 72,546 |
| September..... | 55,361 | 24,146 | 79,507 |
| October..... | 57,067 | 26,789 | 83,856 |
| November..... | 56,333 | 28,584 | 84,917 |
| December..... | 57,058 | 27,964 | 85,022 |
| January, 1910..... | 57,200 | 26,948 | 84,148 |
| February..... | 57,876 | 27,740 | 85,616 |
| March..... | 56,113 | 28,346 | 84,459 |
| April..... | 55,663 | 27,129 | 82,792 |
| May..... | 52,235 | 24,867 | 77,102 |
| June..... | 51,637 | 23,879 | 75,516 |
| July..... | 47,183 | 21,928 | 69,111 |

July Output by Districts

The table below gives the production of all coke and anthracite furnaces in July and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

| | March. (31 days) | April. (30 days) | May. (31 days) | June. (30 days) | July. (31 days) |
|---|---------------------|---------------------|-------------------|--------------------|--------------------|
| New York..... | 180,005 | 166,307 | 171,461 | 163,575 | 162,901 |
| New Jersey..... | 29,557 | 29,092 | 22,973 | 18,443 | 18,962 |
| Lehigh Valley..... | 52,224 | 64,910 | 70,344 | 66,944 | 61,014 |
| Schuylkill Val..... | 62,865 | 61,084 | 65,725 | 60,349 | 61,340 |
| Lower Susquehanna and Lehigh Val..... | 70,738 | 71,694 | 65,667 | 60,315 | 60,043 |
| Pittsburgh dis..... | 592,494 | 543,531 | 510,514 | 483,909 | 502,711 |
| Shenango Val..... | 137,315 | 124,440 | 120,301 | 130,290 | 113,280 |
| West. Penn..... | 143,308 | 141,246 | 144,578 | 132,344 | 129,786 |
| Md., Va. and Kentucky..... | 78,761 | 77,032 | 82,071 | 82,181 | 75,051 |
| Wheeling dis..... | 113,753 | 106,736 | 94,217 | 76,166 | 73,164 |
| Mahoning Val..... | 241,653 | 225,588 | 218,243 | 208,988 | 211,282 |
| Central and North. Ohio..... | 218,660 | 181,805 | 144,344 | 145,393 | 139,627 |
| Hocking Valley, Hanging Rock and S.W. Ohio..... | 47,935 | 48,264 | 43,290 | 41,521 | 30,163 |
| Mich., Minn., Mo., Wis., Col., Wash..... | 77,209 | 75,802 | 71,588 | 68,051 | 65,863 |
| Chicago dis..... | 348,972 | 351,272 | 358,509 | 328,953 | 264,136 |
| Alabama..... | 180,836 | 173,071 | 165,937 | 160,970 | 140,213 |
| Tenn., Georgia and Texas..... | 41,664 | 41,889 | 40,418 | 37,086 | 32,806 |
| Totals..... | 2,617,949 | 2,483,763 | 2,390,180 | 2,265,478 | 2,142,442 |

Capacity in Blast August 1 and July 1

The following table shows the daily capacity of furnaces in blast August 1 and July 1. These figures are based largely on the performance of the furnaces in July and August:

Coke and Anthracite Furnaces in Blast.

| Location of furnaces. | Total number of stacks. | August 1. Number in blast. | Capacity per day. | July 1. Number in blast. | Capacity per day. |
|--|-------------------------|----------------------------|-------------------|--------------------------|-------------------|
| New York: | | | | | |
| Buffalo..... | 16 | 14 | 4,635 | 15 | 5,085 |
| Other New York..... | 7 | 3 | 537 | 3 | 558 |
| New Jersey..... | 8 | 2 | 612 | 3 | 615 |
| Spiegel..... | 2 | .. | .. | .. | .. |
| Pennsylvania: | | | | | |
| Lehigh Valley..... | 23 | 18 | 1,895 | 14 | 2,004 |
| Spiegel..... | 3 | 2 | 160 | 2 | 155 |
| Schuylkill Valley..... | 16 | 8 | 2,062 | 5 | 1,962 |
| Low. Susquehanna..... | 7 | 5 | 935 | 5 | 1,053 |
| Lebanon Valley..... | 10 | 7 | 932 | 7 | 957 |
| Pittsburgh district..... | 50 | 42 | 16,010 | 41 | 16,130 |
| Spiegel..... | 3 | 12 | 302 | 2 | 281 |
| Shenango Valley..... | 20 | 12 | 3,310 | 15 | 3,809 |
| Western Penn..... | 27 | 17 | 4,280 | 16 | 4,285 |
| Maryland..... | 4 | 4 | 973 | 4 | 1,102 |
| Wheeling district..... | 14 | 7 | 2,360 | 7 | 2,340 |
| Ohio: | | | | | |
| Mahoning Valley..... | 22 | 19 | 6,575 | 20 | 7,160 |
| Central and North..... | 22 | 14 | 4,505 | 14 | 4,846 |
| Hocking Val., Hanging Rock and S. W. Ohio..... | 15 | 8 | 887 | 10 | 1,238 |
| Illinois and Indiana..... | 31 | 20 | 8,245 | 21 | 9,135 |
| Spiegel..... | 3 | 2 | 277 | 3 | 330 |
| Michigan, Wisconsin and Minnesota..... | 10 | 6 | 1,075 | 6 | 1,064 |
| Colorado, Missouri and Washington..... | 7 | 5 | 1,170 | 5 | 1,301 |
| The South: | | | | | |
| Virginia..... | 23 | 11 | 1,360 | 11 | 1,280 |
| Kentucky..... | 5 | 1 | 125 | 2 | 312 |
| Alabama..... | 46 | 20 | 4,510 | 22 | 5,065 |
| Tenn. and Georgia..... | 20 | 11 | 1,035 | 12 | 1,235 |
| Totals..... | 414 | 256 | 68,768 | 268 | 73,262 |

The list of furnaces blown out in July, or that were banked and remained inactive over August 1 includes one Lackawanna at Buffalo; one Bethlehem in the Lehigh Valley; one Brooke in the Schuylkill Valley; one Steelton of the Pennsylvania Steel Company; Alice, Fannie and Sharpsville in the Shenango Valley; Perry in western Pennsylvania; Ivanhoe in Virginia; Norton in Kentucky; Hamilton and Sarah in the Hanging Rock district; one Calumet and one South Chicago in the Chicago district; Thomas in Wisconsin; one in Colorado at Pueblo, Gadsden in Alabama, Chattanooga in Tennessee, and Girard in the Mahoning Valley.

Among furnaces blown in last month were one Warwick in the Schuylkill Valley, one Paxton at Harrisburg, Clinton at Pittsburgh, one Cambria and Colonial in western Pennsylvania, Victoria in Virginia, one new Detroit furnace on Zug Island and Irondale in Washington.

The Curves of Pig Iron Production and Prices

The curve of pig iron production from January, 1907, to the present time is shown in the accompanying chart. The figures plotted are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

| | 1907. | 1908. | 1909. | 1910. |
|----------------|--------|--------|--------|--------|
| January..... | 71,149 | 33,718 | 57,975 | 84,148 |
| February..... | 73,038 | 37,163 | 60,976 | 85,616 |
| March..... | 71,821 | 39,619 | 59,232 | 84,459 |
| April..... | 73,885 | 38,289 | 57,962 | 82,792 |
| May..... | 74,048 | 37,603 | 60,753 | 77,102 |
| June..... | 74,486 | 36,444 | 64,656 | 75,516 |
| July..... | 72,763 | 39,287 | 67,793 | 69,111 |
| August..... | 72,594 | 43,851 | 72,546 | .. |
| September..... | 72,783 | 47,300 | 79,507 | .. |
| October..... | 75,386 | 50,554 | 83,856 | .. |
| November..... | 60,937 | 52,595 | 84,917 | .. |
| December..... | 39,815 | 56,158 | 85,022 | .. |

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

| | 1907. | 1908. | 1909. | 1910. |
|------------|----------------------|----------------------|----------------------|----------------------|
| | Sou. Loc. No. 2 Cln. | Sou. Loc. No. 2 Cln. | Sou. Loc. No. 2 Cln. | Sou. Loc. No. 2 Cln. |
| Jan..... | 26.00 | 25.85 | 16.15 | 18.45 |
| Feb..... | 26.00 | 25.85 | 15.75 | 18.16 |
| March..... | 26.00 | 25.10 | 15.50 | 17.85 |
| April..... | 25.06 | 26.35 | 15.20 | 17.73 |
| May..... | 24.25 | 26.85 | 14.75 | 17.63 |
| June..... | 24.10 | 26.60 | 15.25 | 17.73 |
| July..... | 23.85 | 25.55 | 15.00 | 17.55 |
| Aug..... | 23.90 | 24.35 | 15.25 | 17.35 |
| Sept..... | 21.50 | 24.10 | 15.65 | 17.05 |
| Oct..... | 20.95 | 22.45 | 15.75 | 16.85 |
| Nov..... | 19.50 | 20.66 | 16.00 | 17.10 |
| Dec..... | 17.00 | 18.80 | 16.25 | 17.35 |

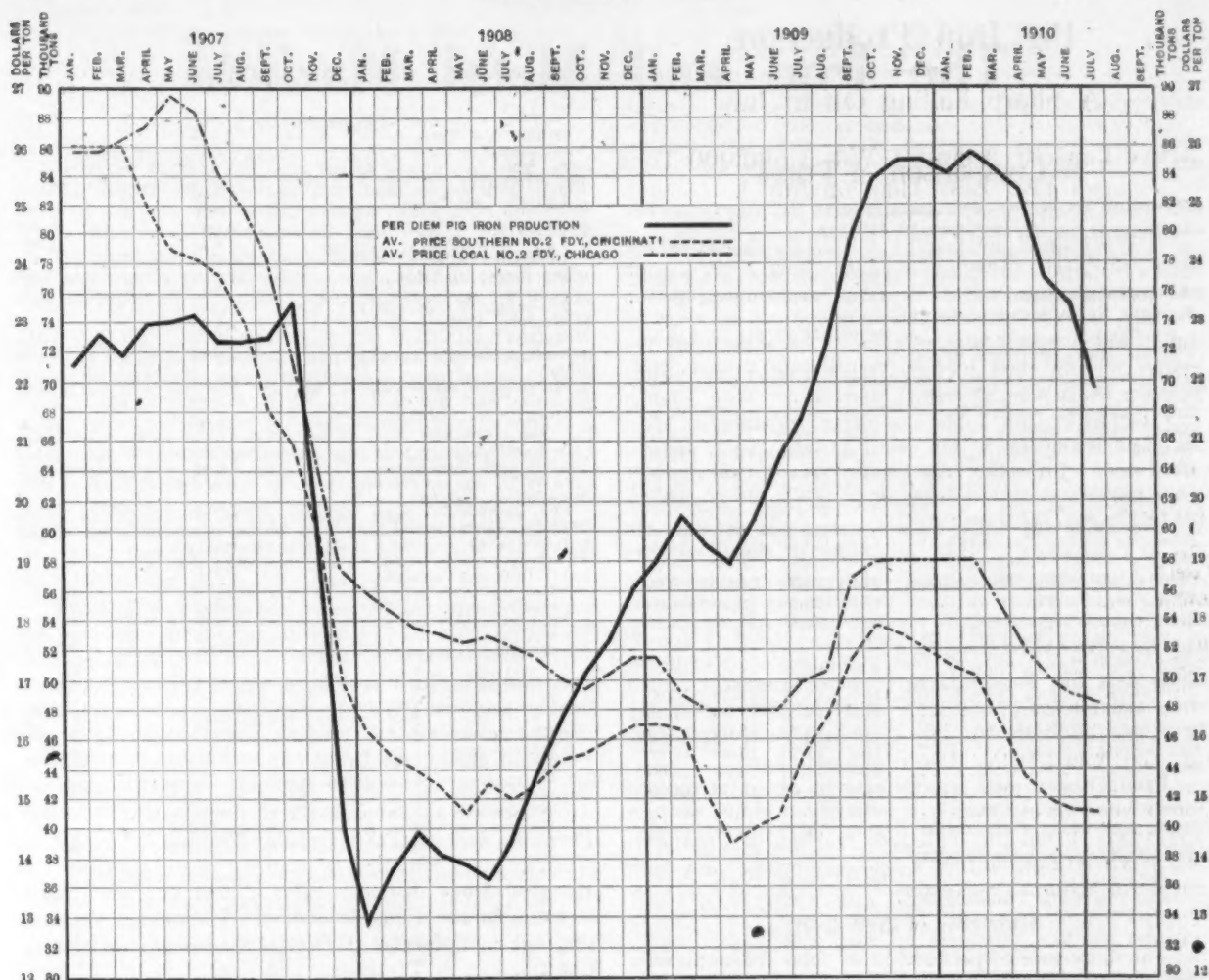


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to August 1, 1910; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago.

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately, but are included in the columns of "total production."

Production of Steel Companies.—Gross Tons.

| | Pig.—Total production. | | | Spiegeleisen and ferromanganese. | |
|-----------------|------------------------|-----------|-----------|----------------------------------|--------|
| | 1907. | 1908. | 1909. | 1909. | 1910. |
| January | 664,415 | 1,117,823 | 1,773,201 | 12,325 | 19,538 |
| February | 745,802 | 1,073,363 | 1,620,539 | 10,046 | 21,396 |
| March | 841,502 | 1,140,553 | 1,739,212 | 23,743 | 25,591 |
| April | 725,548 | 1,093,092 | 1,669,898 | 22,478 | 22,304 |
| May | 759,674 | 1,256,448 | 1,619,283 | 20,834 | 26,529 |
| June | 717,689 | 1,365,527 | 1,549,112 | 16,516 | 27,680 |
| July | 798,639 | 1,508,762 | 1,462,689 | 17,613 | 22,924 |
| August | 897,052 | 1,591,991 | ..... | 22,313 | ..... |
| September | 933,514 | 1,660,839 | ..... | 28,148 | ..... |
| October | 906,481 | 1,769,094 | ..... | 25,384 | ..... |
| November | 981,167 | 1,689,994 | ..... | 23,376 | ..... |
| December | 1,090,339 | 1,768,799 | ..... | 20,791 | ..... |

The Record of Production

Production of Coal and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

| | 1907. | 1908. | 1909. | 1910. |
|-----------------|-----------|-----------|-----------|-----------|
| January | 2,205,607 | 1,045,250 | 1,797,560 | 2,608,605 |
| February | 2,045,068 | 1,077,740 | 1,707,340 | 2,397,254 |
| March | 2,226,457 | 1,228,204 | 1,832,194 | 2,617,949 |
| April | 2,216,558 | 1,149,602 | 1,738,877 | 2,483,763 |
| May | 2,295,505 | 1,165,688 | 1,883,330 | 2,390,180 |
| June | 2,234,575 | 1,092,131 | 1,930,866 | 2,265,478 |
| July | 2,255,660 | 1,218,129 | 2,103,431 | 2,142,442 |
| August | 2,250,410 | 1,359,831 | 2,248,930 | ..... |
| September | 2,183,487 | 1,418,996 | 2,385,206 | ..... |
| October | 2,336,972 | 1,567,198 | 2,599,541 | ..... |
| November | 1,828,125 | 1,577,854 | 2,547,508 | ..... |
| December | 1,234,279 | 1,740,912 | 2,035,680 | ..... |

Cincinnati Metal Trades Outing.—The fifth annual outing of the Cincinnati Metal Trades Association was held July 30 at Chester Park, the city's great amusement grounds. Ideal weather conditions helped to bring out a large attendance, and it is estimated

that over 30,000 people took part in the festivities, making this the largest gathering of its kind in the history of the association. Employer and employee joined with equal enthusiasm in the athletic games, and the management is to be complimented in its successful efforts to bring about more amicable relations between these two interests. Secretary Manley of the Trades Association, who arranged the programme, and Harry Lewis, who superintended the athletic sports, have both received many congratulations on the happy outcome of the affair.

The De Kalb Fence Company, De Kalb, Ill., has sold its plant and business to the American Steel & Wire Company. The plant will continue in operation and a mill office will be maintained at De Kalb, but the sales department and general office business will be carried on in the future from the Chicago office of the American Steel & Wire Company. The office employees at De Kalb have been offered positions in the Chicago office, it being the policy of the American Steel & Wire Company to take care of them.

In the Chicago district one Calumet furnace of the Wisconsin Steel Company was blown out on July 3 for relining, and will be ready again for blast in the latter part of August. At the South Works of the Illinois Steel Company No. 8 furnace was blown out July 8.

The report of the American Railway Association shows that on July 20 the net surplus of idle cars on the lines of the United States and Canada was 133,301, a decrease of 9564, or about 6 per cent., in two weeks. Idle coal cars increased by about 500, while box cars decreased by 6200.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

| Aug. 3, 1910. | July 27, 1910. | July 6, 1910. | Aug. 4, 1909. |
|--|----------------|---------------|---------------|
| PIG IRON, Per Gross Ton: | | | |
| Foundry No. 2, standard, Philadelphia..... | \$16.00 | \$16.25 | \$16.25 |
| Foundry No. 2, Southern, Cincinnati..... | 14.50 | 14.75 | 14.75 |
| Foundry No. 2, local, Chicago..... | 16.50 | 16.50 | 16.75 |
| Basic, delivered, eastern Pa..... | 15.25 | 15.50 | 15.75 |
| Basic, Valley furnace..... | 14.25 | 14.50 | 14.50 |
| Bessemer, Pittsburgh..... | 16.15 | 16.40 | 16.90 |
| Gray forge, Pittsburgh..... | 14.40 | 14.40 | 14.90 |
| Lake Superior charcoal, Chicago..... | 18.50 | 18.50 | 19.50 |

| | | | |
|---|-------|-------|-------|
| BILLETS, &c., Per Gross Ton: | | | |
| Bessemer billets, Pittsburgh..... | 24.50 | 24.50 | 25.00 |
| Forging billets, Pittsburgh..... | 30.00 | 30.00 | 30.00 |
| Open hearth billets, Philadelphia..... | 27.50 | 28.50 | 27.00 |
| Wire rods, Pittsburgh..... | 28.50 | 29.00 | 30.00 |
| Steel rails, heavy, at mill..... | 28.00 | 28.00 | 28.00 |

| | | | |
|---|-------|-------|-------|
| OLD MATERIAL, Per Gross Ton: | | | |
| Steel rails, melting, Chicago..... | 13.50 | 13.00 | 13.50 |
| Steel rails, melting, Philadelphia..... | 13.75 | 14.00 | 14.25 |
| Iron rails, Chicago..... | 16.50 | 16.50 | 17.00 |
| Iron rails, Philadelphia..... | 18.00 | 18.00 | 19.00 |
| Car wheels, Chicago..... | 14.50 | 14.75 | 15.00 |
| Car wheels, Philadelphia..... | 14.00 | 14.00 | 15.00 |
| Heavy steel scrap, Pittsburgh..... | 14.50 | 14.00 | 15.00 |
| Heavy steel scrap, Chicago..... | 12.25 | 12.25 | 12.75 |
| Heavy steel scrap, Philadelphia..... | 13.75 | 14.00 | 14.25 |

FINISHED IRON AND STEEL,

| Per Pound: | Cents. | Cents. | Cents. | Cents. |
|---------------------------------------|--------|--------|--------|--------|
| Refined iron bars, Philadelphia..... | 1.42½ | 1.42½ | 1.47½ | 1.45 |
| Common iron bars, Chicago..... | 1.40 | 1.40 | 1.40 | 1.37½ |
| Common iron bars, Pittsburgh..... | 1.45 | 1.50 | 1.50 | 1.45 |
| Steel bars, tidewater, New York..... | 1.56 | 1.61 | 1.61 | 1.46 |
| Steel bars, Pittsburgh..... | 1.40 | 1.45 | 1.45 | 1.30 |
| Tank plates, tidewater, New York..... | 1.56 | 1.56 | 1.61 | 1.56 |
| Tank plates, Pittsburgh..... | 1.40 | 1.40 | 1.45 | 1.40 |
| Beams, tidewater, New York..... | 1.56 | 1.56 | 1.61 | 1.56 |
| Beams, Pittsburgh..... | 1.40 | 1.40 | 1.45 | 1.40 |
| Angles, tidewater, New York..... | 1.56 | 1.56 | 1.61 | 1.56 |
| Angles, Pittsburgh..... | 1.40 | 1.40 | 1.45 | 1.40 |
| Skelp, grooved steel, Pittsburgh..... | 1.50 | 1.50 | 1.50 | 1.35 |
| Skelp, sheared steel, Pittsburgh..... | 1.00 | 1.60 | 1.60 | 1.45 |

SHEETS, NAILS AND WIRE,

| Per Pound: | Cents. | Cents. | Cents. | Cents. |
|--|--------|--------|--------|--------|
| Sheets, black, No. 28, Pittsburgh..... | 2.25 | 2.25 | 2.30 | 2.20 |
| Wire nails, Pittsburgh..... | 1.70 | 1.70 | 1.80 | 1.80 |
| Cut nails, Pittsburgh..... | 1.65 | 1.70 | 1.75 | 1.75 |
| Barb wire, galv., Pittsburgh..... | 2.00 | 2.00 | 2.10 | 2.10 |

METALS, Per Pound:

| | Cents. | Cents. | Cents. | Cents. |
|------------------------------------|--------|--------|--------|--------|
| Lake copper, New York..... | 12.75 | 12.62½ | 12.75 | 13.50 |
| Electrolytic copper, New York..... | 12.50 | 12.50 | 12.37½ | 13.00 |
| Spelter, New York..... | 5.20 | 5.20 | 5.20 | 5.00 |
| Spelter, St. Louis..... | 5.05 | 5.05 | 5.05 | 5.45 |
| Lead, New York..... | 4.40 | 4.40 | 4.40 | 4.35 |
| Lead, St. Louis..... | 4.25 | 4.25 | 4.25 | 4.20 |
| Tin, New York..... | 33.20 | 33.25 | 32.80 | 29.50 |
| Antimony, Hallett, New York..... | 8.00 | 8.00 | 8.12½ | 7.50 |
| Nickel, New York..... | 45.00 | 45.00 | 45.00 | 45.00 |
| Tin plate, 100 lb., New York..... | \$3.84 | \$3.84 | \$3.84 | \$3.64 |

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¾ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¾ in. thick, 1.45c. plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c.

base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c. base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¾ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¾ in. plates. Plates over 72 in. wide must be ordered ¾ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

| | |
|---|--------|
| Gauges under ¾ in. to and including 3-16 in. on thinnest edge..... | \$0.10 |
| Gauges under 3-16 in. to and including No. 8..... | .15 |
| Gauges under No. 8 to and including No. 9..... | .25 |
| Gauges under No. 9 to and including No. 10..... | .30 |
| Gauges under No. 10 to and including No. 12..... | .40 |
| Sketches (including all straight taper plates), 3 ft. and over in length..... | .10 |
| Complete circles, 3 ft. diameter and over..... | .20 |
| Boiler and flange steel..... | .10 |
| "A. B. M. A." and ordinary firebox steel..... | .20 |
| Still bottom steel..... | .30 |
| Marine steel..... | .40 |
| Locomotive firebox steel..... | .50 |
| Widths over 100 in. up to 110 in., inclusive..... | .05 |
| Widths over 110 in. up to 115 in., inclusive..... | .10 |
| Widths over 115 in. up to 120 in., inclusive..... | .15 |
| Widths over 120 in. up to 125 in., inclusive..... | .25 |
| Widths over 125 in. up to 130 in., inclusive..... | .50 |
| Widths over 130 in..... | 1.00 |
| Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive..... | .25 |
| Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive..... | .50 |
| Cutting to lengths or diameters under 1 ft..... | 1.55 |
| No charge for cutting rectangular plates to lengths 3 ft. and over. | |

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.05c.; Nos. 22 to 24, 2.10c.; Nos. 25 and 26, 2.20c.; No. 27, 2.20c.; No. 28, 2.25c.; No. 29, 2.30c.; No. 30, 2.40c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.70c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 3.05c.; No. 27, 3.15c.; No. 28, 3.35c.; No. 29, 3.50c.; No. 30, 3.70c. Painted roofing sheets, No. 28, \$1.65 per square. Galvanized roofing sheets, No. 28, \$3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

| | Steel. | Black. | Galv. | Iron. | Black. | Galv. |
|----------------------------------|--------|--------|-------|-------|--------|-------|
| ¾ and 1 in..... | 70 | 54 | 66 | 53 | | |
| 1 in..... | 71 | 57 | 67 | 53 | | |
| 1½ in..... | 74 | 62 | 70 | 58 | | |
| 2 in..... | 78 | 68 | 74 | 64 | | |
| 2½ to 3 in..... | 72 | 57 | 68 | 53 | | |
| Plugged and Reamed. | | | | | | |
| 1 to 4 in..... | 76 | 66 | 72 | 62 | | |
| Extra Strong, Plain Ends. | | | | | | |
| 1½ to 2 in..... | 63 | 51 | 59 | 47 | | |
| 2 to 4 in..... | 70 | 58 | 66 | 54 | | |
| 4½ to 8 in..... | 66 | 54 | 62 | 50 | | |
| 9, 10, 11 and 12 in..... | 54 | 42 | | | | |
| Double Extra Strong, Plain Ends. | | | | | | |
| 1½ to 8 in..... | 59 | 48 | 55 | 44 | | |

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

| | Steel. | Iron. |
|--|--------|-------|
| 1 to 1½ in..... | 49 | 43 |
| 1½ to 2½ in..... | 61 | 43 |
| 2½ in..... | 63 | 48 |
| 2½ to 5 in..... | 69 | 55 |
| 6 to 13 in..... | 61 | 43 |
| 2½ in. and smaller, over 18 ft., 10 per cent. net extra. | | |
| 2½ in. and larger, over 22 ft., 10 per cent. net extra. | | |

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, \$28.50 to \$29; open hearth and chain rods, \$29.

Steel Rivets.—Structural rivets, ¾ in. and larger, 2.15c. base; cone head boiler rivets, ¾ in. and larger, 2.25c. base; ¾ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

THE IRON AND METAL MARKETS

Pittsburgh

PARK BUILDING, August 3, 1910.—(By Telegraph.)

Pig Iron.—Inquiry is light and usually for small lots to cover current needs. Regarding the reported sale by a Valley furnace of 10,000 tons of basic iron to a speculator at \$14, at furnace, it is stated that cash is to be paid for the iron, and it is to be piled at the expense of the buyer, with 6 per cent. interest added for storage charges. Several small lots of basic have been sold by dealers in the past week at \$14.25, Valley furnace, and a sale is also reported of 1500 tons of standard Bessemer iron to a local steel casting interest at \$15.25, Valley furnace, or \$16.15, Pittsburgh, deliveries being August, September and October. There is an inquiry out for 1500 tons of gray forge for delivery over the next three months, which may be closed this week. We quote standard Bessemer iron at \$15.25; basic, \$14.25; malleable Bessemer, \$14.50 to \$14.75; gray forge, \$13.50, and No. 2 foundry, \$14.25, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90c. a ton.

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Sheets.—The trade is looking for announcement by the leading makers of a reduction in prices of sheets in the near future to meet the lower prices that have been ruling in the market for several months. One local sheet mill is reported to be accepting business for delivery through the remainder of this year on the basis of 2.20c., at mill, for No. 28 black. In the present condition of the market, consumers are placing orders cautiously. The new demand for blue annealed and electrical sheets is fairly active. We quote the sheet market on the basis of 2.20c. to 2.25c., for No. 28 box annealed one-pass black sheets and 3.45c. to 3.50c. for No. 28 galvanized. It is stated that some makers will not accept new orders for extended delivery at the minimum named.

Tin Plate.—A vote is now being taken among the lodges of the Amalgamated Association with a view of calling off the strike in the tin plate mills of the American Sheet & Tin Plate Company, which was declared July 1, 1909, against the "open shop" policy. The strike was lost by the men months ago, and it is very likely it will be officially declared off. If this is done it will allow Amalgamated members to work in the tin plate mills of the company and still retain their good standing in the organization. The new demand for tin plate is quiet, but all the leading mills are running to full capacity and shipping the output as fast as made. The market continues very firm, and we quote on the basis of \$3.60 for 100-lb. cokes, per base box, f.o.b. Pittsburgh.

Bars.—At a conference held in Chicago last week the Western Bar Iron Association came to a settlement with the Amalgamated Association, agreeing to pay the same scale as the Republic Iron & Steel Company. This disposes of all possible labor troubles among the bar iron mills and some of the plants in the West have since started up. The new demand for iron and steel bars is only fair, but the agricultural interests are specifying freely on the season's

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

Aug. 3, July 27, July 6, Aug. 4,
1910. 1910. 1910. 1909.

PIG IRON, Per Gross Ton:

| | | | | |
|---|---------|---------|---------|---------|
| Foundry No. 2, standard, Philadelphia | \$16.00 | \$16.25 | \$16.25 | \$16.75 |
| Foundry No. 2, Southern, Cincinnati | 14.50 | 14.75 | 14.75 | 16.25 |
| Foundry No. 2, local, Chicago | 16.50 | 16.50 | 16.75 | 17.00 |
| Basic, delivered, eastern Pa. | 15.25 | 15.50 | 15.75 | 16.50 |
| Basic, Valley furnace | 14.25 | 14.50 | 14.50 | 15.25 |
| Bessemer, Pittsburgh | 16.15 | 16.40 | 16.40 | 16.90 |
| Gray forge, Pittsburgh | 14.40 | 14.40 | 14.90 | 14.90 |
| Lake Superior charcoal, Chicago | 18.50 | 18.50 | 18.50 | 19.50 |

BILLETS, &c., Per Gross Ton:

| | | | | |
|---|-------|-------|-------|-------|
| Bessemer billets, Pittsburgh | 24.50 | 24.50 | 25.00 | 24.00 |
| Forging billets, Pittsburgh | 30.00 | 30.00 | 30.00 | 28.00 |
| Open hearth billets, Philadelphia | 27.50 | 28.50 | 28.50 | 27.00 |
| Wire rods, Pittsburgh | 28.50 | 29.00 | 30.00 | 31.00 |
| Steel rails, heavy, at mill | 28.00 | 28.00 | 28.00 | 28.00 |

OLD MATERIAL, Per Gross Ton:

| | | | | |
|--|-------|-------|-------|-------|
| Steel rails, melting, Chicago | 13.50 | 13.00 | 13.50 | 15.25 |
| Steel rails, melting, Philadelphia | 13.75 | 14.00 | 14.25 | 16.50 |
| Iron rails, Chicago | 16.50 | 16.50 | 17.00 | 17.50 |
| Iron rails, Philadelphia | 18.00 | 18.00 | 19.00 | 19.50 |
| Car wheels, Chicago | 14.50 | 14.75 | 15.00 | 16.00 |
| Car wheels, Philadelphia | 14.00 | 14.00 | 14.50 | 15.00 |
| Heavy steel scrap, Pittsburgh | 14.50 | 14.00 | 15.00 | 16.00 |
| Heavy steel scrap, Chicago | 12.25 | 12.25 | 12.75 | 14.75 |
| Heavy steel scrap, Philadelphia | 13.75 | 14.00 | 14.25 | 16.50 |

FINISHED IRON AND STEEL,

| Per Pound: | Cents. | Cents. | Cents. | Cents. |
|--|--------|--------|--------|--------|
| Refined iron bars, Philadelphia | 1.42½ | 1.42½ | 1.47½ | 1.45 |
| Common iron bars, Chicago | 1.40 | 1.40 | 1.40 | 1.37½ |
| Common iron bars, Pittsburgh | 1.45 | 1.50 | 1.50 | 1.45 |
| Steel bars, tidewater, New York | 1.56 | 1.61 | 1.61 | 1.46 |
| Steel bars, Pittsburgh | 1.40 | 1.45 | 1.45 | 1.30 |
| Tank plates, tidewater, New York | 1.56 | 1.56 | 1.61 | 1.56 |
| Tank plates, Pittsburgh | 1.40 | 1.40 | 1.45 | 1.40 |
| Beams, tidewater, New York | 1.56 | 1.56 | 1.61 | 1.56 |
| Beams, Pittsburgh | 1.40 | 1.40 | 1.45 | 1.40 |
| Angles, tidewater, New York | 1.56 | 1.56 | 1.61 | 1.56 |
| Angles, Pittsburgh | 1.40 | 1.40 | 1.45 | 1.40 |
| Skelp, grooved steel, Pittsburgh | 1.50 | 1.50 | 1.50 | 1.35 |
| Skelp, sheared steel, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.45 |

SHEETS, NAILS AND WIRE,

| Per Pound: | Cents. | Cents. | Cents. | Cents. |
|---|--------|--------|--------|--------|
| Sheets, black, No. 28, Pittsburgh | 2.25 | 2.25 | 2.30 | 2.20 |
| Wire nails, Pittsburgh | 1.70 | 1.70 | 1.80 | 1.80 |
| Cut nails, Pittsburgh | 1.65 | 1.70 | 1.75 | 1.75 |
| Barb wire, galv., Pittsburgh | 2.00 | 2.00 | 2.10 | 2.10 |

METALS, Per Pound:

| | Cents. | Cents. | Cents. | Cents. |
|-------------------------------------|--------|--------|--------|--------|
| Lake copper, New York | 12.75 | 12.62½ | 12.75 | 13.50 |
| Electrolytic copper, New York | 12.50 | 12.50 | 12.37½ | 13.00 |
| Spelter, New York | 5.20 | 5.20 | 5.20 | 5.60 |
| Spelter, St. Louis | 5.05 | 5.05 | 5.05 | 5.45 |
| Lead, New York | 4.40 | 4.40 | 4.40 | 4.35 |
| Lead, St. Louis | 4.25 | 4.25 | 4.25 | 4.20 |
| Tin, New York | 33.20 | 33.25 | 32.80 | 29.50 |
| Antimony, Hallett, New York | 8.00 | 8.00 | 8.12½ | 7.50 |
| Nickel, New York | 45.00 | 45.00 | 45.00 | 45.00 |
| Tin plate, 100 lb., New York | \$3.84 | \$3.84 | \$3.84 | \$3.64 |

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¾ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¾ in. thick, 1.45c. plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; tees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c.,

base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¾-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¾-in. plates. Plates over 72 in. wide must be ordered ¾-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

| | |
|--|--------|
| Gauges under ¾-in. to and including 3-16-in. on thinnest edge | \$0.10 |
| Gauges under 3-16-in. to and including No. 8 | .15 |
| Gauges under No. 8 to and including No. 9 | .25 |
| Gauges under No. 9 to and including No. 10 | .30 |
| Gauges under No. 10 to and including No. 12 | .40 |
| Sketches (including all straight taper plates), 3 ft. and over in length | .10 |
| Complete circles, 3 ft. diameter and over | .20 |
| Boiler and flange steel | .10 |
| "A. B. M. A." and ordinary firebox steel | .20 |
| Still bottom steel | .30 |
| Marine steel | .40 |
| Locomotive firebox steel | .50 |
| Widths over 100 in. up to 110 in., inclusive | .05 |
| Widths over 110 in. up to 115 in., inclusive | .10 |
| Widths over 115 in. up to 120 in., inclusive | .15 |
| Widths over 120 in. up to 125 in., inclusive | .25 |
| Widths over 125 in. up to 130 in., inclusive | .50 |
| Widths over 130 in. | 1.00 |
| Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive | .25 |
| Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive | .50 |
| Cutting to lengths or diameters under 1 ft. | 1.55 |
| No charge for cutting rectangular plates to lengths 3 ft. and over. | |

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.05c.; Nos. 22 to 24, 2.10c.; Nos. 25 and 26, 2.20c.; No. 27, 2.20c.; No. 28, 2.25c.; No. 29, 2.30c.; No. 30, 2.40c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.70c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 3.05c.; No. 27, 3.15c.; No. 28, 3.35c.; No. 29, 3.50c.; No. 30, 3.70c. Painted roofing sheets, No. 28, \$1.65 per square. Galvanized roofing sheets, No. 28, \$3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

| | Steel. | Black. | Galv. | Black. | Galv. |
|----------------------------------|--------|--------|-------|--------|-------|
| ¾ and 1 in. | 70 | 54 | 66 | 57 | 53 |
| 1 in. | 71 | 57 | 67 | 57 | 53 |
| 1½ in. | 74 | 62 | 70 | 60 | 58 |
| 2 in. | 78 | 68 | 74 | 64 | 64 |
| 2½ to 6 in. | 72 | 57 | 68 | 53 | 53 |
| 7 to 12 in. | 72 | 57 | 68 | 53 | 53 |
| Plugged and Reamed. | | | | | |
| 1 to 4 in. | 70 | 60 | 72 | 62 | 62 |
| Extra Strong, Plain Ends. | | | | | |
| 1½ to ¾ in. | 63 | 51 | 59 | 47 | 47 |
| ¾ to 4 in. | 70 | 58 | 68 | 54 | 54 |
| 4½ to 8 in. | 66 | 54 | 62 | 50 | 50 |
| 9, 10, 11 and 12 in. | 54 | 42 | .. | .. | .. |
| Double Extra Strong, Plain Ends. | | | | | |
| 1½ to 8 in. | 59 | 48 | 55 | 44 | 44 |

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

| | Steel. | Iron. |
|--|--------|-------|
| 1 to 1½ in. | 49 | 43 |
| 1½ to 2¼ in. | 61 | 43 |
| 2¼ in. | 63 | 48 |
| 2½ to 5 in. | 69 | 55 |
| 6 to 13 in. | 61 | 43 |
| 2½ in. and smaller, over 18 ft., 10 per cent. net extra. | | |
| 2½ in. and larger, over 22 ft., 10 per cent. net extra. | | |

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, \$28.50 to \$29; open hearth and chain rods, \$29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 2.15c., base; cone head boiler rivets, ¾-in. and larger, 2.25c., base; ¾-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

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Structural Material.—New inquiries are fairly active, but there is some hesitation by the large interests in placing contracts. In July the new bookings of the American Bridge Company were only slightly over 30,000 tons, or about half the business it took in June. The Ritter-Conley Mfg. Company has taken 1500 tons for a new building for the Semet-Solvay Process Company, at Detroit, Mich., and 2000 tons for a new steel building for another concern. The Jones & Laughlin Steel Company has taken about 400 tons for the Holy Rosary schools in Homewood, Pa., and 300 tons for the new building of the Twentieth Century Club in this city. Several of the local fabricating concerns report they are pretty well filled up for the next two or three months and are passing up some of the cheap work. Complaint is still made about the low prices at which some jobs have recently been taken, and it is stated that if 1.40c., Pittsburgh, was paid for the plain material some of this work went below cost. We quote beams and channels up to 15-in. at 1.40c. to 1.45c., f.o.b. Pittsburgh.

Plates.—The New York Central Lines placed an order last week for 46 locomotives, divided between the American Locomotive Company and the Montreal Locomotive Company. The Ritter-Conley Mfg. Company has taken 2½ to 3 miles of steel riveted pipe work for the city of New York, the plates for which will be rolled by the Carnegie Steel Company. No new car orders have been placed in the past week and inquiries from the railroads are very light. A better buying movement in cars by the railroads is expected in the fall. Some of the plate mills are decidedly short of work, having very little ahead. The steel car companies are also pretty well cleaned up on orders on their books. We quote ¼-in. and heavier plates at 1.40c. to 1.45c., Pittsburgh, but on the narrower sizes some of the smaller plate mills are naming 1.35c., Pittsburgh.

Sheets.—The trade is looking for announcement by the leading makers of a reduction in prices of sheets in the near future to meet the lower prices that have been ruling in the market for several months. One local sheet mill is reported to be accepting business for delivery through the remainder of this year on the basis of 2.20c., at mill, for No. 28 black. In the present condition of the market, consumers are placing orders cautiously. The new demand for blue annealed and electrical sheets is fairly active. We quote the sheet market on the basis of 2.20c. to 2.25c., for No. 28 box annealed one-pass black sheets and 3.45c. to 3.50c. for No. 28 galvanized. It is stated that some makers will not accept new orders for extended delivery at the minimum named.

Tin Plate.—A vote is now being taken among the lodges of the Amalgamated Association with a view of calling off the strike in the tin plate mills of the American Sheet & Tin Plate Company, which was declared July 1, 1909, against the "open shop" policy. The strike was lost by the men months ago, and it is very likely it will be officially declared off. If this is done it will allow Amalgamated members to work in the tin plate mills of the company and still retain their good standing in the organization. The new demand for tin plate is quiet, but all the leading mills are running to full capacity and shipping the output as fast as made. The market continues very firm, and we quote on the basis of \$3.60 for 100-lb. cokes, per base box, f.o.b. Pittsburgh.

Bars.—At a conference held in Chicago last week the Western Bar Iron Association came to a settlement with the Amalgamated Association, agreeing to pay the same scale as the Republic Iron & Steel Company. This disposes of all possible labor troubles among the bar iron mills and some of the plants in the West have since started up. The new demand for iron and steel bars is only fair, but the agricultural interests are specifying freely on the season's

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contracts and shipments by the steel bar mills are heavy. Iron bars are only in fair demand, specifications from railroads and other consumers not coming in as freely as desired. Recent contracts for steel bars were made on the basis of 1.40c., Pittsburgh, and this is the absolute minimum of the market. We quote steel bars at 1.40c. to 1.45c. and iron bars at 1.45c. to 1.50c., Pittsburgh.

Spelter.—The market continues quiet. We quote prime grades of Western at 5c. to 5.05c., East St. Louis, or 5.12½c. to 5.17½c., Pittsburgh.

Hoops and Bands.—Specifications against contracts are being received in a fairly satisfactory way, but new orders placed are mostly in small lots to meet current needs. We quote steel hoops for forward delivery at 1.50c. to 1.55c. and steel bands at 1.45c. to 1.50c., f.o.b. Pittsburgh, extras as per the steel bar card applying on the latter.

Spikes.—Some fair sized orders for railroad spikes are being placed by the railroads, a local maker having taken contracts in the past few days for about 2000 kegs for the Baltimore & Ohio and 1500 kegs for the Wabash. The new demand for small railroad and boat spikes is not heavy. We quote standard sizes of railroad spikes, 4½ x 9-16 in. and larger, at 1.50c. to 1.55c., for Western shipment, and 1.55c. to 1.60c., for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, these prices being for carload and larger lots.

Rivets.—Specifications on orders are coming in fairly well, but new business being placed is light. Official prices on structural rivets are 2.15c. and on boiler rivets 2.25c., f.o.b. Pittsburgh, but on desirable orders these prices are shaded.

Shafting.—Specifications on shafting from the automobile makers have fallen off to some extent lately, and the new demand from other consumers is not as heavy as it was some time ago. However, the shafting makers are fairly well filled with work for several months. Regular discounts on shafting are 55 per cent. off in carload and larger lots and 50 per cent. off in small lots, delivered in base territory. For desirable specifications the carload price of 55 per cent. off is sometimes shaded to the extent of about 55 and 5 off.

Wire Products.—The new demand for wire nails and other wire products was stimulated to only a slight extent by the recent reduction of \$2 a ton in prices, the increased demand not being as heavy as expected. A notable increase in the demand for barb wire on 80 rod spools is reported, and new prices on this product were recently sent out by the American Steel & Wire Company and the Pittsburgh Steel Company. We quote galvanized barb wire at \$2; painted, \$1.75; annealed fence wire, \$1.50; galvanized, \$1.80; wire nails, \$1.70, and cut nails, \$1.65 to \$1.70 in carload and larger lots, all f.o.b. Pittsburgh, freight to destination added.

Merchant Pipe.—The Texas Company, which bought 200 miles of 6 and 8-in line pipe not long ago, is in the market for 60 to 75 miles of 3, 4, 6 and 8-in., and the contract is expected to be placed this week. On the larger sizes of pipe the mills are pretty well filled up for the rest of this year, but on butt weld sizes the new demand continues light, as it has been for practically all of this year. Official discounts on iron and steel pipe are reported as being fairly well maintained.

Boiler Tubes.—The order for 65 freight locomotives recently placed by the Pennsylvania Railroad with the American Locomotive Company will be filled from the latter's shops in this city, and the contract for the boiler tubes is reported to have been placed with a local mill. On merchant tubes the new demand is fair. Regular discounts on both merchant and locomotive tubes are more or less shaded.

Coke.—The Westinghouse Air Brake Company is reported to have closed for 5000 to 6000 tons of foundry coke for shipment over the remainder of this year at a price equal to about \$2.25 per net ton at oven. Several large inquiries are in the market for foundry coke for shipment over the remainder of this year and in the first half of next year. The output of coke is being restricted, but there is still an overproduction and prices are weak. In the past week the Upper and Lower Connellsville regions turned out about 397,000 net tons of coke, a slight decrease over the previous week. We quote best grades of furnace coke running under 1 per cent. in sulphur for delivery over last half of this year at \$1.80 to \$1.85 and best grades of 72-hour foundry coke at \$2.15 and up to \$2.50 per net ton at oven for same delivery, the higher price being paid for foundry coke with very high reputation for quality. Furnace coke loaded on cars, and which has to be moved, is being offered at \$1.60 to \$1.65 per net ton at oven.

Iron and Steel Scrap.—Some new inquiry for heavy steel scrap came up in the past week, and several local dealers report sales of 3000 to 4000 tons, for delivery in Monessen, Pa., and Steubenville, Ohio, at prices ranging

from \$14.50 to \$14.75, delivered. A local dealer also reports sales of 1000 tons of heavy steel scrap at \$14.50 and 2000 tons at \$15, delivered, carrying a 60c. freight rate. There is more inquiry for other grades of scrap and the tone of the market is stronger. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

| | |
|--|--------------------|
| Heavy steel scrap, Steubenville, Folsom, Sharon, Monessen and Pittsburgh delivery..... | \$14.50 to \$14.75 |
| No. 1 foundry cast..... | 14.00 to 14.25 |
| No. 2 foundry cast..... | 13.00 to 13.25 |
| Bundled sheet scrap, at point of shipment..... | 9.75 to 10.00 |
| Recycling rails, Newark and Cambridge, Ohio, and Cumberland, Md..... | 15.75 to 16.00 |
| No. 1 railroad malleable scrap..... | 13.75 to 14.00 |
| Grate bars..... | 10.75 to 11.00 |
| Low phosphorus melting stock..... | 18.00 to 18.50 |
| Iron car axles..... | 21.00 to 21.50 |
| Steel car axles..... | 19.00 to 19.50 |
| Locomotive axles..... | 25.00 to 25.50 |
| No. 1 busheling scrap..... | 12.50 to 12.75 |
| No. 2 busheling scrap..... | 8.50 to 8.75 |
| Old car wheels..... | 14.00 to 14.50 |
| Sheet bar crop ends..... | 16.00 to 16.25 |
| Cast iron borings..... | 7.50 to 7.75 |
| Machine shop turnings..... | 9.25 to 9.50 |

Chicago

FISHER BUILDING, August 3, 1910.—(By Telegraph.)

The physical movement of business throughout the West continues a great deal better than the business done on paper and the general discussion in commercial circles. Manufacturers as a rule are comfortably busy and there is no lack of employment for all the labor that can be had. Crop conditions average better than public discussion would indicate, as rains throughout the West, which relieved the situation, have not been given as much publicity as the threatening hot wave of the week before. It is a curious condition that business should be better than generally accepted reports would indicate, but this condition has prevailed for several months in the West. The only halting tendency is on purchases for forward delivery. Industrial buyers appear to be satisfied for the present that more iron and steel is being produced than the country will need, and they are taking advantage of the situation by purchasing only for immediate or early delivery without placing long time contracts as they have done in the past whenever they had reason to fear a scarcity of materials or advancing prices. The steel mills are kept comfortably busy with the specifications in hand and would be as busy as they were last winter if the demand for structural shapes and plates had not been checked by financial conditions this summer, which have kept the railroads out of the car market and restricted loans for large steel buildings. The demand from store continues good, especially for structural material in small lots, and the fabricators who handle small jobs are all busy. The demand for open hearth sheets has been so active that the local mill has not been able to stock its large warehouse, which has been erected for that purpose. Current consumption of iron and steel appears on the whole to be fully equal to the normal rate, excepting in the industries which sell to railroads. The scrap market continues weak, but all the material that arrives is disposed of readily at present prices and dealers are not accumulating stocks in their yards.

Pig Iron.—The undertone of weakness which has prevailed for some time in the Southern market has developed into a general admission that the market is now on the basis of \$11, Birmingham, for No. 2 foundry. Very little business is known to have been done. Buyers generally have all the iron bought or in their yards that they will need for the third quarter, and many of them are covered for the fourth quarter. Inquiries are coming forward for the first quarter and first half of 1911, but the buyers who submit these inquiries generally qualify them by expressing the opinion that they expect to buy at the current price. The furnace interests are not willing to consider 1911 business at the prices which have prevailed recently, and some of them are still holding at \$12 or \$12.50, Birmingham, for the last quarter. Recent events in the financial world have had considerable influence on the course of the market. Buyers generally concede that iron is cheap at \$11, and that it would pay them to take in spot iron and hold it several months, but the average buyer would have to use bank funds to do this, and the bankers are pursuing a cautious policy with their customers until the future of the financial situation is more assured. This condition in the financial world also has a tendency to check interest in deliveries beyond the end of the year. In Northern iron a little more business is being done locally, but it does not amount to a buying movement. The weekly sales of the local interests are about equal to their production, and the business on their books covers their output about as far ahead as they seem willing to go. Several very attractive inquiries

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for first quarter and first half of 1911 have appeared, and the tone of the Northern market is somewhat better, but only a few sales have been made under special conditions in which deliveries run beyond December. The railroad situation will probably become an important feature of the market in the near future, especially in Southern iron. Railroad equipment has been running down steadily for three years, both in cars and motive power, and car shortages and delays in transit will undoubtedly be more serious the coming winter than in the past four years, if not worse than four years ago. This will make it prudent for foundries to have good stocks of iron when winter sets in. Buyers generally took this precaution last fall, and although there was a check in business early in the winter the Southern furnaces reported a great deal of trouble in getting cars. The following prices are for August and September shipment, Chicago delivery:

| | |
|--|--------------------|
| Lake Superior charcoal..... | \$18.50 to \$19.00 |
| Northern coke foundry, No. 1..... | 17.00 to 17.50 |
| Northern coke foundry, No. 2..... | 16.50 to 17.00 |
| Northern coke foundry, No. 3..... | 16.25 to 16.50 |
| Northern Scotch, No. 1..... | 17.50 to 18.00 |
| Southern coke, No. 1..... | 15.85 to 16.35 |
| Southern coke, No. 2..... | 15.35 to 15.85 |
| Southern coke, No. 3..... | 15.10 to 15.60 |
| Southern coke, No. 4..... | 14.85 to 15.35 |
| Southern coke, No. 1 soft..... | 15.85 to 16.35 |
| Southern coke, No. 2 soft..... | 15.35 to 15.85 |
| Southern gray forge..... | 14.60 to 15.10 |
| Southern mottled..... | 14.60 to 15.10 |
| Malleable Bessemer..... | 16.50 to 17.00 |
| Standard Bessemer..... | 17.90 to 18.40 |
| Jackson Co. and Kentucky silvery, 6%..... | 19.40 to 19.90 |
| Jackson Co. and Kentucky silvery, 8%..... | 20.40 to 20.90 |
| Jackson Co. and Kentucky silvery, 10%..... | 21.40 to 21.90 |

(By Mail.)

Billets.—A few sales of forging billets have been made quietly in this market by local mills, establishing a base price on forging billets of \$29 to \$30. A sale of 1500 tons of billets for shipment to Canada was also made recently. Chicago mills are now making this market a basing point for billets independent of Pittsburgh, quoting lower prices than Pittsburgh, plus freight to Chicago. If this policy is continued it will mark a forward step in the progress of the steel industry in Chicago. Ultimately it is expected that this market will make as low prices as Pittsburgh on billets and the principal lines of rolled products, as the crude steel is produced here at as low a cost as anywhere else in the world, and it is only a question of time when the mill capacity will be large enough to supply the demand.

Rails and Track Supplies.—Inquiries for rails are light, as the standard roads have contracted for their requirements for the year. The demand for traction rails has been checked somewhat this summer by the financial situation, which has restricted the promotion of new street car and interurban lines. Track supplies, however, continue an exception to the general policy of the railroad purchasing departments, as good orders and specifications for spikes and bolts continue to come in. We quote standard railroad spikes at 1.75c. to 1.85c., base; track bolts with square nuts, 2.40c. to 2.50c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., \$27; 30 to 35 lb., \$27.50; 16, 20 and 25 lb., \$28; 12 lb., \$29, Chicago.

Structural Material.—The market for structural shapes is holding up well under the depressing influences that have affected this market. The difficulty that builders have encountered in obtaining loans has held back many important projects in the way of new buildings, and, while it is believed the situation is clearing up in this respect, it will be some time before building operations reflect the improvement in the money market. Railroad contracts for bridge material have also been disappointing in their volume. Last week, however, there was a good run of small contracts. The American Bridge Company booked 630 tons for shops at Sacramento for the Western Pacific Railroad; 250 tons for the Solano County court house in California; 630 tons for Government wharf sheds at Fort Mason, Cal.; 200 tons for a power house for the Empire Zinc Company, Leadville, Colo., and 175 tons of steel columns for the Fisher Building at Denver, a reinforced concrete building in which it has been decided to use steel columns. The Noelke-Richards Company, Indianapolis, has taken the steel contract, 2600 tons, for the Union Pacific office building at Omaha. The Paxton-Vierling Iron Works, Omaha, has taken a 390-ton contract for a freight house for the Chicago, Burlington & Quincy Railroad at Omaha. The Minneapolis Steel & Machinery Company will furnish 910 tons of ore spouts for the Great Northern ore docks at Allouez Bay, Wis. The Worden-Allen Company, Milwaukee, booked 550 tons for new machine shops for the Calumet & Hecla Copper Company. The Wisconsin Bridge Company, Milwaukee, will fabricate 465 tons for additions to the shops of the National Brake & Electric Company in that city. The Orpheum Theatre, Peoria, Ill., 305 tons, was let to the Joliet Bridge Company. The power house of the Wichita (Kan.) Electric Light Company, 250 tons, went to the Indiana Bridge Company.

A local foundry at St. Louis took the contract for 260 tons of cast iron bases for a freight house at St. Louis for the Missouri, Kansas & Texas Railroad. Plans will be revised for the office building of the Dime Savings Bank, at Detroit, and the warehouse of Marshall Field & Co., in Chicago. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—There is a good demand for boiler plates, but car shop business, which furnishes the largest tonnage in this market, is not as good as was expected. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—New business in sheets is coming forward at a very satisfactory rate, and the 18 mills of the Inland Steel Company have been kept in operation since they were started a month ago. This, however, may be due in part to the growing preference among buyers for open hearth sheets, the only kind made in the Chicago district. The demand for these sheets from the West has been so steady that the Inland Steel Company has not been able to stock its new warehouse, which is now completed and ready for use. The original plan was to stock this warehouse with all the standard sizes of open hearth sheets, so that prompt carload shipments can be made. This plan will be carried out as soon as surplus stock can be accumulated. It is not intended to engage in store distribution, but merely to have a large warehouse stock for the convenience of carload buyers, so that they can obtain prompt shipments without awaiting their turn on the rolling schedules of the mills. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.48c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—The bar trade continues to lead the market, with soft steel bars in the unusual position of commanding higher prices than structural shapes or plates. The hard steel bar mills report a good run of new business, principally for concrete work. The bar iron market remains quiet, as railroad purchases, which make the greater part of this market, are under the restriction of orders given to the purchasing departments by the presidents of the railroads some time ago. There is a good run of orders from wagon manufacturers and other buyers of bar iron. The bar iron mills are more depressed than any other branch of the trade, as general business is good in the West and the consumption of iron and steel is normal, excepting in railroad equipment and repair work. The rolling mill wage scale was settled last week by a renewal for another year of the agreement of the Western Bar Iron Association. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.63c. to 1.68c.; bar iron, 1.40c. to 1.45c.; hard steel bars rolled from old rails, 1.50c. to 1.60c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Jobbers are generally carrying light stocks of wire products and in some cases they have offered to stock up if they could be assured of an advance in prices during the fall. It is understood, however, that no assurances of this character have been given, as the growing competition in the wire trade will make the market dependent upon general business conditions as reflected by supply and demand. It is understood that the leading interest has discontinued the policy of holding official prices to be shaded by independent mills and will follow the market in the future. Current business is good and an active demand is expected for fall trade as a result of the general depletion of stocks. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.65c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—There is a satisfactory run of routine orders and several municipalities are in the market for lots of a few hundred tons each. All bids were rejected at Cheyenne, Wyo., where a letting of 3000 tons of water pipe had been advertised. The market for water pipe has been affected somewhat by the condition of the bond market this summer, which has restricted the sales of municipal bonds by cities. This is particularly true in Oklahoma, where the disposition of the Legislature to authorize defaults or delays in the payment of interest has made it difficult to place bonds with Eastern investors. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., \$28; 6 to 12 in., \$27; 16-in. and up, \$26, with \$1 extra for gas pipe.

Old Material.—The market is drifting along without enough transactions to afford a close check on prices. There is no congestion, as dealers are able to place at current prices all the material that arrives, but the leading buyers have accumulated large stocks and are very indifferent when material is offered them. A Western railroad obtained \$16.25 for rerolling rails last week, and to make a delivered price

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switching charges would have to be added to this figure, but the mills are able to buy rerollers in the market at a shade under \$15.75, delivered, making a spread of nearly \$1 on different transactions in this material. A similar difference is found in the prices of railroad malleable, as recent sales have been made by railroads at higher prices than dealers can obtain, and this has also been true of frogs, switches and guards. Heavy melting steel remains practically unchanged in price, but short rails are higher, as the large lots which depressed the market some time ago have been disposed of. No. 1 cast scrap, which held steady for a long time when other grades of scrap were declining, is now reported a little weaker. Old car wheels are also lower, a lot of 500 tons going last week at \$14.25 on the tracks of the road making the sale, equal to \$14.50, delivered. The prices quoted below are for delivery to consumers in this district, all freight and switching charges paid, sellers of scrap usually receiving 50c. to \$1 per ton less. Following prices are per gross ton, delivered, Chicago:

| | |
|---|--------------------|
| Old iron rails..... | \$16.50 to \$17.00 |
| Old steel rails, rerolling..... | 15.75 to 16.25 |
| Old steel rails, less than 3 ft..... | 13.50 to 14.00 |
| Relaying rails, standard sections, subject to inspection..... | 24.00 to 25.00 |
| Old car wheels..... | 14.50 to 15.00 |
| Heavy melting steel scrap..... | 12.25 to 12.75 |
| Frogs, switches and guards, cut apart..... | 12.25 to 12.75 |
| Shoveling steel..... | 11.75 to 12.25 |

The following quotations are per net ton:

| | |
|---|--------------------|
| Iron angles and splice bars..... | \$14.00 to \$14.50 |
| Iron car axles..... | 19.50 to 20.00 |
| Steel car axles..... | 19.50 to 20.00 |
| No. 1 railroad wrought..... | 12.00 to 12.50 |
| No. 2 railroad wrought..... | 11.00 to 11.50 |
| Springs, knuckles and couplers..... | 11.50 to 12.00 |
| Locomotive tires, smooth..... | 17.00 to 17.50 |
| No. 1 dealers' forge..... | 10.50 to 11.00 |
| Steel axle turnings..... | 9.00 to 9.50 |
| Machine shop turnings..... | 7.25 to 7.75 |
| Cast and mixed borings..... | 4.75 to 5.25 |
| No. 1 bushing..... | 10.25 to 10.75 |
| No. 2 bushing..... | 8.00 to 8.50 |
| No. 1 boilers, cut to sheets and rings..... | 9.00 to 9.50 |
| No. 1 cast scrap..... | 12.75 to 13.25 |
| Stove plate and light cast scrap..... | 11.00 to 11.50 |
| Railroad malleable..... | 11.00 to 11.50 |
| Agricultural malleable..... | 10.50 to 11.00 |
| Pipes and flues..... | 9.25 to 9.75 |

Metals.—See paragraph on this subject under the heading "Metal Market," in another column.

Philadelphia

PHILADELPHIA, PA., August 2, 1910.

Buying continues light, and prices, particularly in pig iron, are easier. Foundry grades move along slowly, the principal buyers being the cast iron pipe makers. In finished materials specifications are coming out fairly satisfactorily, but current business is mainly in small lots. Plates and shapes seem to be a trifle firmer. A new basis has been established for open hearth rolling billets, the leading Eastern maker naming \$27.50 to \$28, delivered, for third quarter, with forging billets at an advance of \$2 a ton above rolling billets. Sheets and refined iron bars are dull, with prices easy. Coke remains firm, while the situation in the old material market is practically unchanged.

Pig Iron.—Comparatively few sales of any size are reported. Consumers frequently inquire for fair tonnages, but when it comes to placing orders quantities are usually scaled down considerably. The cast iron pipe foundries have been the most aggressive buyers, taking lots of several thousand tons of low grade Northern and Virginia iron. In the higher grades sales are closely confined to small lots, usually at a shade lower prices than recently quoted; \$16, delivered, has and can be readily done for fair sized orders for standard brands of Northern No. 2 X foundry iron, although \$16.25 is the more usual price for ordinary business, and occasionally a small sale at \$16.50 is reported. Several buyers are feeling around for iron for early 1911 delivery, but so far no seller is willing to quote so far ahead. The range between No. 2 X foundry and No. 2 plain foundry is not so wide; at \$16 for No. 2 X the majority of sellers would only concede a difference of 25 cents between the two grades. The situation in Virginia foundry iron is somewhat confused. Sales at \$13.50, furnace, for No. 2 X foundry are reported in small and moderate lots, although some sellers contend that \$13.25 can be done. The leading sellers have in a number of cases flatly refused to accept the lower figure, although it is contended that iron has been offered consumers in other districts at that figure by other sellers. No sales at the lower level have yet been reported, although the market does not have a very strong appearance, as there are still some weak sellers in the district. Basic iron shows no movement, but sellers manifest a willingness to accept lower prices should business be offered. The nominal price for this grade is \$15.25, delivered in this territory, although it is not improbable that this price could be shaded 25 cents

if the tonnage was satisfactory and the delivery point favorable. Forge iron for rolling mill purposes has not been active, but sales of this grade to cast iron pipe makers are reported at confidential prices. For good brands \$15 to \$15.25, delivered in this territory, about represents the range of the market. Sales of upward of 1000 tons of standard low phosphorus iron are reported at prices equal to \$22.50 to \$22.75, delivered in this territory. The following range of prices about represents the market for moderate lots, delivered in buyers' yards, eastern Pennsylvania and nearby points:

| | |
|--|--------------------|
| Eastern Pennsylvania, No. 2 X foundry..... | \$16.00 to \$16.50 |
| Eastern Pennsylvania, No. 2 plain..... | 15.75 to 16.25 |
| Virginia, No. 2 X foundry..... | 16.25 to 16.50 |
| Virginia, No. 2 plain..... | 16.00 to 16.25 |
| Gray forge..... | 15.00 to 15.25 |
| Basic..... | 15.25 |
| Standard low phosphorus..... | 22.50 to 22.75 |

Ferromanganese.—Sales are reported in the West, although the demand from consumers in this territory remains practically at a standstill. No particular change is to be noted in prices, \$39, seaboard, about representing the minimum for 80 per cent., although some sellers are out of the market at that figure.

Billets.—There has been a slightly improved demand, particularly for deliveries during the third quarter, but the amount of actual business booked has been small and mostly for prompt delivery. Prices are lower, the leading producer in this territory now quoting \$27.50 to \$28 for ordinary open hearth rolling billets, delivered in this vicinity, during the third quarter, and forging billets at \$29.50 to \$30, at mill, with the usual extras for high carbons and special sizes.

Plates.—A very satisfactory run of specifications continues, and the majority of the producers are able to maintain a comparatively even production. A good demand for small lots of boiler and bridge plates is reported, with an increased demand for tank plates, a few fair sized lots of the latter being before the trade. Prices are being pretty well maintained, minimum quotations ranging from 1.55c. to 1.60c., delivered in this vicinity, with 1.60c. to 1.65c. named for small lots. More effort on the part of consumers to contract for the remainder of the year at present prices is to be noted, but, as a rule, Eastern mills are not inclined to accept business for extended delivery.

Structural Material.—There is still a scarcity of large propositions in this district, and revised bids will probably be taken on some of the building work recently figured upon. A very fair volume of small business continues to be offered, not sufficient, however, to enable mills to gain very much, as, at the present rate of production, orders on hand are being steadily reduced. Prices are unchanged, 1.55c. to 1.60c., delivered, about representing the minimum for plain shapes, dependent on specifications.

Sheets.—Business continues of a hand to mouth character, and mills are not very well fixed for forward business. Sales are principally for early delivery and confined to small lots, for which the following range of prices is named, although concessions could be had if a desirable tonnage came out: Nos. 18 to 20, 2.70c.; Nos. 22 to 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.

Bars.—The situation is practically unchanged. Refined iron bars are not in active demand, and while prices for delivery in this territory range from 1.42½c. to 1.52½c., it is believed that on desirable specifications concessions might be had. Mills are not actively engaged and show more anxiety for business. Steel bars remain strong at 1.60c., delivered here.

Coke.—A few sales of foundry coke for delivery over the last half of the year are reported, one fair order going at \$2.40, at oven. Some sellers are firm at \$2.50 for this grade, although others will accept business at \$2.25. Furnace coke is rather quiet at unchanged prices. The following range about represents the market, per net ton, delivered in buyers' yards in this territory:

| | |
|---------------------------------|------------------|
| Connellsville furnace coke..... | \$4.00 to \$4.15 |
| Foundry coke..... | 4.50 to 4.75 |
| Mountain furnace coke..... | 3.60 to 3.75 |
| Foundry coke..... | 4.10 to 4.35 |

Old Material.—A trifle better movement in some of the cheaper grades of scrap, particularly borings, is reported. The general market, however, continues dull. Consumers endeavor to buy a trifle under present quotations in some instances, but sellers refuse to let go, even at the present market, when any tonnage is involved. Very little has been done in heavy melting steel scrap. The associated mills, being well supplied, have reduced their offering price to \$13.75, delivered. The same buyer offers \$16 for No. 1 railroad wrought and \$8 for No. 2 light iron, delivery in all cases at eastern Pennsylvania mill. In several lines of scrap not enough business has been done to establish a market. Bids and offers for delivery in buyers' yards, eastern Pennsylvania

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and nearby points, carrying a freight rate from Philadelphia of 45c. to \$1.30, range about as follows:

| | |
|----------------------------------|--------------------|
| No. 1 steel scrap and crops..... | \$13.75 to \$14.25 |
| Old steel rails, rerolling..... | 15.50 to 16.00 |
| Low phosphorus..... | 19.00 to 19.50 |
| Old steel axles..... | 20.00 to 20.50* |
| Old iron axles..... | 26.50 to 27.50* |
| Old iron rails..... | 18.00 to 18.50 |
| Old car wheels..... | 14.00 to 14.50 |
| No. 1 railroad wrought..... | 16.00 to 16.50 |
| Wrought iron pipe..... | 13.50 to 14.00 |
| No. 1 forge fire..... | 12.00 to 12.50 |
| No. 2 light iron..... | 7.50 to 8.00 |
| Wrought turnings..... | 9.00 to 9.50 |
| Cast borings..... | 9.50 to 9.75 |
| Machinery cast..... | 14.50 to 15.00 |
| Railroad malleable..... | 14.00 to 14.50 |
| Grate bars..... | 11.50 to 12.00 |
| Stove plate..... | 10.00 to 10.50 |

* Nominal.

Cleveland

CLEVELAND, OHIO, August 2, 1910.

Iron Ore.—Shipments from docks to the furnaces are rather light, and, owing to the limited dock space, boats are being delayed in disposing of their cargoes. The ore movement down the lakes continues quite heavy, but August is expected to show some falling off as compared with July. General conditions in the lake trade show no change. Contract boats are taking about all of the ore tonnage, so that there is little demand for wild boats. We quote ore prices as follows: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.20; Mesaba non-Bessemer, \$4.

Pig Iron.—An inquiry is out for 10,000 tons of basic and some improvement is noted in the volume of foundry iron inquiries from a few of the larger consumers that appear to be feeling the market. Among these is one from northern Ohio for 2000 to 4000 tons of foundry iron for the last half and two from Michigan stove manufacturers for the last quarter and first half, one for 2000 tons and the other for 7500 tons. A few inquiries for lots of 500 tons and under have also come out. The sale of about 2500 tons of malleable is reported. A Valley interest reports the sale of 500 tons of No. 2 foundry. Quotations remain about stationary. Several interests are refusing to meet present quotations on foundry iron, holding for \$14.50 for No. 2. Quotations as low as \$14, at furnace, however, are being made for No. 2 foundry by one or two interests. For prompt shipment and the last half we quote, delivered, Cleveland, as follows:

| | |
|---|------------------|
| Bessemer..... | \$16.40 |
| Northern foundry, No. 1..... | \$15.25 to 15.75 |
| Northern foundry, No. 2..... | 14.75 to 15.25 |
| Northern foundry, No. 3..... | 14.25 to 14.75 |
| Gray forge..... | 14.15 to 14.40 |
| Southern foundry, No. 2..... | 15.60 to 15.85 |
| Jackson Co. silvery, 8 per cent. silicon..... | 19.25 to 19.50 |

Coke.—A fair volume of business is being done in foundry coke contracts for the last half of this year and the first half of next. Furnace grades are very quiet. Some of the producers that have been selling foundry grades at \$2.25 have advanced their price to \$2.50. We quote standard Connellsville furnace coke at \$1.55 to \$1.65, per net ton, at oven, for spot shipment, and \$1.80 to \$1.85 for the last half. Connellsville 72-hour foundry coke is held at \$2.15 to \$2.40 per net ton, at oven, for spot shipment, and \$2.25 to \$2.50 for the last half.

Finished Iron and Steel.—Following the recent concession in steel bar prices to the agricultural implement trade in this territory, the expected reduction to general consumers has been made by a leading independent interest, which is now making the quotation of 1.40c., Pittsburgh, for fair sized lots. The leading interest and other independent mills have not yet met this price, but it appears very probable that they will do so. Contracts made with some of the implement trade before the price cutting have been revised on the 1.40c. basis. Business in all finished lines is generally quiet, both in the volume of specifications and new orders. The falling off in orders has resulted in some improvement in steel bar deliveries and fairly good shipment can now be secured on some sizes. The demand for iron bars is not active and prices are weak. The usual quotation is 1.40c., at mill, but this can probably be shaded. There is a fair demand for small lots of plates, but consumers are buying only for their immediate requirements. Prices are firm at 1.40c. to 1.45c., Pittsburgh, the former being the usual quotation for carload lots. There is a fair demand for small lots of structural material, but work requiring large tonnages, considerable of which is pending, is slow in coming out. The contract for a new plant for the Republic Rubber Company, Youngstown, has been let to the Forest City Steel & Iron Company, Cleveland. It will require 600 tons of steel. The erection of the Marine National Bank Building, Erie, Pa., for which there was an inquiry out for 800 tons,

has been held up. We quote plain structural material, 1.40c. to 1.45c., Pittsburgh. The demand for sheets continues quiet. While prices are weak, there appears less irregularity in quotations than during the past few weeks. The usual quotations at present on No. 28 are 2.20c. for black and 3.30c. for galvanized. Blue annealed sheets remain firm. Warehouse business with jobbers continues fairly good. Store prices on steel bars have been reduced to 1.80c.

Old Material.—There was some buying in moderate lots by mills in the Pittsburgh district in this market late last week, but this spurt of activity has subsided and the market is again lifeless. Prices still show a downward tendency, but the absence of transactions in some grades makes such quotations largely nominal. Heavy melting steel is slightly weaker, and quotations on busheling and cast scrap have been reduced 50c. a ton. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

| | |
|--------------------------------------|--------------------|
| Old steel rails..... | \$14.50 to \$15.00 |
| Old iron rails..... | 16.00 to 16.50 |
| Steel car axles..... | 20.00 to 20.50 |
| Heavy melting steel..... | 13.00 to 13.25 |
| Old car wheels..... | 14.00 to 14.50 |
| Relaying rails, 50 lb. and over..... | 22.50 to 23.50 |
| Agricultural malleable..... | 12.00 to 12.50 |
| Railroad malleable..... | 13.00 to 13.50 |
| Light bundled sheet scrap..... | 9.00 to 9.50 |

The following prices are per net ton, f.o.b. Cleveland:

| | |
|--|--------------------|
| Iron car axles..... | \$21.00 to \$21.50 |
| Cast borings..... | 5.50 to 6.00 |
| Iron and steel turnings and drillings..... | 6.75 to 7.25 |
| Steel axle turnings..... | 9.00 to 9.50 |
| No. 1 busheling..... | 11.00 to 11.50 |
| No. 1 railroad wrought..... | 13.00 to 13.50 |
| No. 1 cast..... | 11.50 to 12.00 |
| Stove plate..... | 10.50 to 11.00 |
| Bundled tin scrap..... | 11.00 to 11.50 |

Birmingham

BIRMINGHAM, ALA., July 31, 1910.

Pig Iron.—The volume of business transacted in this market the past week was no larger than that reported for the two weeks just previous. As to whether or not there has been further decline in prices by reason of the continued inactivity a definite statement is not warranted, owing to the lack of interest by the trade generally, even in small lots for immediate shipment. It is not believed that sales effected the past week will aggregate 1000 tons and inquiries now pending that can be expected to result in sales involve hardly so much. It is understood that with one probable exception all producing interests in this district would accept a basis of \$11.50, Birmingham, for deliveries to cover the remainder of this year. Spot shipments and even round tonnages for delivery during a limited period are also quoted on a basis of \$11.50, and no sales are known to have been made at lower figures; yet, in view of the lack of demand for any deliveries, quotations are considered nominal and in some cases are no doubt subject to shading. The daily output of furnaces now in operation is being moved, and it is believed that reports for August 1 as to stock accumulations will show that no increase was made in the month of July. An addition to the output of foundry grades has just been effected by a change of operations at a local plant, and it is understood that two stacks now in operation that were scheduled to go out of blast in July will be kept going for some weeks longer. The total production of foundry iron in this district is now represented by 15 stacks, with four additional stacks producing basic iron. There is as yet no tangible evidence of an improvement in the condition of the foundry trade, and the best authorities on existing conditions would not be surprised at further curtailment in the production in order to adjust the output to the consumption. It is believed that stocks on foundry yards have been very materially reduced, but in a number of cases second quarter, and even first quarter, sales are still undelivered, with frequent requests that third quarter shipments be deferred.

Cast Iron Pipe.—The curtailment in output which was anticipated has not occurred and reports are more favorable as to new business for early placing. The city of Gadsden, Ala., is to place from 750 to 1000 tons of water pipe the coming week, and a number of round tonnages for Pacific Coast points are now under consideration. Prices have declined with prices for other finished materials and we revise quotations as follows, per net ton, f.o.b. cars here: 4 to 6 in., \$22.50; 8 to 12 in., \$21.50; over 12-in., average \$20.50, with \$1 per ton extra for gas pipe. These prices are arrived at from transactions involving comparatively small tonnages and are probably subject to shading for large municipal requirements.

Old Material.—This market is in practically the same condition as at the time of last report. Dealers find it difficult to replenish their stocks readily, owing to the scarcity of certain grades, but there is no report as yet of a scarcity

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of any grades to consumers. Prices as last quoted are adhered to as follows, per gross ton, f.o.b. cars here:

| | |
|---------------------------------|--------------------|
| Old iron axes..... | \$16.50 to \$17.00 |
| Old iron rails..... | 12.50 to 13.00 |
| Old steel axes..... | 16.00 to 16.50 |
| No. 1 railroad wrought..... | 11.50 to 12.00 |
| No. 2 railroad wrought..... | 9.00 to 9.50 |
| No. 1 country wrought..... | 8.50 to 9.00 |
| No. 2 country wrought..... | 8.00 to 8.50 |
| No. 1 machinery..... | 10.00 to 10.50 |
| No. 1 steel..... | 9.00 to 9.50 |
| Tram car wheels..... | 9.50 to 10.00 |
| Standard car wheels..... | 11.00 to 11.50 |
| Light cast and stove plate..... | 7.00 to 7.50 |

The furnace of the Southern Iron & Steel Company at Trussville, Ala., did not go out last week in accordance with report to that effect in these columns.

The Woodward Iron Company, Woodward, Ala., has put both its active furnaces on the production of foundry iron.

The Alice Furnace of the Tennessee Coal, Iron & Railroad Company at Birmingham has been put on foundry iron instead of basic.

Cincinnati

CINCINNATI, OHIO, August 3, 1910.—(By Telegraph.)

Pig Iron.—A Columbus machinery manufacturer has an inquiry out for 2000 tons of malleable, to be distributed over eight months, beginning November. A central Ohio stove interest is asking for 1200 tons of foundry iron, and it is also reported that the leading pipe manufacturer wants a 1000-ton lot of foundry iron for one of its Ohio plants. While \$11.50 is still being asked for Southern No. 2 foundry, at furnace, some interests are reported as soliciting offers under this, and for prompt shipment \$11 is possible. A St. Louis consumer is stated to have purchased 1000 tons of No. 2 Southern foundry at \$11.50, Birmingham, for first half delivery next year. Northern irons are not very strong, and \$14.50 to \$15 is quoted for No. 2, with very little actual business doing, although there are some inquiries out both for last half and first quarter delivery. For immediate delivery and through the last half, based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

| | |
|--|--------------------|
| Southern coke, No. 1 foundry..... | \$15.00 to \$15.25 |
| Southern coke, No. 2 foundry..... | 14.50 to 15.00 |
| Southern coke, No. 3 foundry..... | 14.00 to 14.25 |
| Southern coke, No. 4 foundry..... | 13.75 to 14.00 |
| Southern coke, No. 1 soft..... | 15.00 to 15.50 |
| Southern coke, No. 2 soft..... | 14.50 to 15.00 |
| Southern gray forge..... | 13.75 to 14.00 |
| Ohio silvery, 8 per cent. silicon..... | 19.20 |
| Lake Superior coke, No. 1..... | 16.20 to 16.70 |
| Lake Superior coke, No. 2..... | 15.70 to 16.20 |
| Lake Superior coke, No. 3..... | 15.20 to 15.70 |
| Standard Southern car wheel..... | 25.25 to 25.75 |
| Lake Superior car wheel..... | 22.25 to 22.75 |

Coke.—Local offices report business quiet but prices are firm. To a certain extent, coke has been a puzzling proposition. Ordinarily, it follows pig iron, but while there has been a softening in figures for the latter, coke has stubbornly remained steady. A local interest closed last week a contract for a 12 months' supply of Pocahontas furnace coke aggregating 7000 tons at a price around \$1.85 per net ton at oven. Considerable buying to fill immediate requirements of foundry coke is reported, though a large percentage of the foundries is understood to have made future contracts. Connellsville furnace coke is quoted at \$1.70 to \$1.85 at oven. Pocahontas furnace ranges from \$1.85 to \$1.90. From \$2.10 to \$2.25, at oven, would cover foundry coke of the Connellsville, Pocahontas and Wise County districts. A small tonnage of Connellsville changed hands last week on a \$2 basis, but it was an emergency sale for immediate shipment.

Finished Iron and Steel.—Business is quiet, although some sellers state that July will average up very well with any previous month of the year. Some steel bars have lately been sold out of stock, and the demand for structural material is about the same. For beams and channels we quote from stock, 1.90c. to 2c.

Old Material.—The market is very slow, with no desire on the part of seller or buyer to start things moving. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

| | |
|---|--------------------|
| No. 1 railroad wrought, net ton..... | \$12.00 to \$12.50 |
| Cast borings, net ton..... | 4.50 to 5.00 |
| Steel turnings, net ton..... | 6.00 to 7.00 |
| No. 1 cast scrap, net ton..... | 11.50 to 12.50 |
| Burnt scrap, net ton..... | 8.00 to 9.00 |
| Old iron axes, net ton..... | 17.50 to 18.50 |
| Old steel rails, gross ton..... | 14.50 to 15.00 |
| Relaying rails, 50 lb. and up, gross ton..... | 22.50 to 23.50 |
| Old car wheels, gross ton..... | 12.00 to 13.00 |
| Heavy melting steel scrap, gross ton..... | 12.00 to 12.50 |

St. Louis

ST. LOUIS, MO., August 1, 1910.

Though the market for pig iron is quiet, some of the leading brokers confidently look for a gradual increase in the demand during the present month. The firmness beginning to be apparent on the part of producers has eliminated short selling by merchant houses and is attracting the attention of consumers. With one exception, the leading brokers find the large buyers of coke among their customers have supplied their wants for the present. Bank clearings for this city, Kansas City and St. Joseph again exceeded the corresponding week last year. Skilled mechanics are fully employed and more men in some lines of manufacture are wanted. Lower prices for grain and cotton show improved crop conditions. Money is fairly easy and collections are good. Railroad buying is still being curtailed, awaiting the outcome of the crops and a better outlook in the stock market.

Coke.—The demand for coke from large buyers, with all but one office, has slackened up as the normal result of some weeks of activity, and such demand as is now passing is coming from medium to small consumers. The only large transactions reported came from the office referred to, which in the aggregate booked contracts for 8100 tons for a year's shipment—all Virginia coke. The market is firming up, especially on Connellsville makes. Some of the leading brokers state that the ovens are pretty well filled up with orders and are not pressing for new business. The lowest price mentioned for standard Connellsville 72-hour foundry is \$2.35 for long contracts, net net ton, f.o.b. oven. Virginia is held at \$2.25. Jobbing lots command 25c. per ton more.

Pig Iron.—At the close of the past week a firmer tone developed for pig iron. Leading brokers that have admitted giving buyers encouragement to submit offers of less than the nominal price state that instructions have been received to support it. As far as can be learned, no one is offering Southern No. 2 foundry at \$11, Birmingham, at least where the standard analysis is the basis for trading. With some offices, however, the week was very quiet and no business of consequence booked. One of the leading brokers reports scattering orders aggregating about 1000 tons, all Southern iron and for shipment over the remainder of the year, while another office reports about the same tonnage of all grades, with scattering inquiries for about 800 tons. The nominal price for Southern No. 2 foundry for shipment over the remainder of the year is \$11.50, and other grades at the usual difference, and there is more disposition than has obtained of late to stand for this price. Southern Ohio is held at \$15, f.o.b. furnace.

Old Material.—Leading dealers state that the market is very dull; even the trading which for some time has been going on among dealers was very light during the week. Being the last of the month, no railroad lists are posted. Owing to this inactivity prices on several items have been reduced and the tone of the market is weaker. Relaying rails, though in quite moderate supply, are lower. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

| | |
|---|--------------------|
| Old iron rails..... | \$14.50 to \$15.00 |
| Old steel rails, rerolling..... | 14.00 to 14.50 |
| Old steel rails, less than 3 ft..... | 13.00 to 13.50 |
| Relaying rails, standard sections, subject to inspection..... | 23.50 to 24.00 |
| Old car wheels..... | 14.50 to 15.00 |
| Heavy melting steel scrap..... | 12.50 to 13.00 |
| Frogs, switches and guards, cut apart..... | 12.50 to 13.00 |

The following quotations are per net ton:

| | |
|---|--------------------|
| Iron fish plates..... | \$14.00 to \$14.50 |
| Iron car axles..... | 19.50 to 20.00 |
| Steel car axles..... | 19.00 to 19.50 |
| No. 1 railroad wrought..... | 13.50 to 14.00 |
| No. 2 railroad wrought..... | 12.50 to 13.00 |
| Railway springs..... | 11.50 to 12.00 |
| Locomotive tires, smooth..... | 16.50 to 17.00 |
| No. 1 dealers' forge..... | 11.00 to 11.50 |
| Mixed borings..... | 5.50 to 6.00 |
| No. 1 bushing..... | 11.00 to 11.50 |
| No. 1 boilers, cut to sheets and rings..... | 9.50 to 10.00 |
| No. 1 cast scrap..... | 10.50 to 11.00 |
| Stove plate and light cast scrap..... | 9.00 to 9.50 |
| Railroad malleable..... | 9.50 to 10.00 |
| Agricultural malleable..... | 8.50 to 9.00 |
| Pipes and flues..... | 9.50 to 10.00 |
| Railroad sheet and tank scrap..... | 8.50 to 9.00 |
| Railroad grate bars..... | 8.50 to 9.00 |
| Machine shop turnings..... | 8.00 to 8.50 |

Metals.—See paragraph on this subject under the heading "Metal Market," in another column.

The new railroad bridge which is to span the Ohio River at Metropolis, Ill., will be built by the Paducah & Illinois Bridge Company.

The American Car & Foundry Company is reported to have undertaken to build for its own account and lease to the St. Louis & San Francisco lines 500 box cars, 500 dumping stock cars and 250 tank cars. During the severe elec-

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trical storm, with high wind, of July 25, an electric traveling crane at the company's plant, foot of St. George street, which weighed 30 tons, was blown off its track and badly damaged.

The contract for the iron work for the new Union railroad station at Memphis, Tenn., has been awarded to the Noelke-Richards Iron Works, Indianapolis, Ind.

San Francisco

SAN FRANCISCO, CAL., July 27, 1910.

No real activity is manifest in any department of the iron and steel market, little if any improvement being noted over the condition at the beginning of the month. The current needs of most consuming interests are provided for by purchases made earlier in the season, and so far there is no indication of any general movement to provide for the future. This condition is causing no discouragement, as a month or two of dullness is to be expected in the midsummer season. Conditions are favorable for a renewed demand from Pacific Coast manufacturing interests within the next month, as there is considerable work in sight as soon as the labor troubles can be brought to an end. A fair tonnage is being booked by local jobbers, who are maintaining prices in all lines, though they are still carrying large supplies. A few fabricating orders for structural material are coming out, the bulk of the business being taken by Eastern interests. Tank plates are moving in a small way, though there is considerable business in prospect. All descriptions of steel pipe are quiet, with little immediate prospect of improvement.

Plates.—The demand for plates has not entirely recovered from the recent depression, though deliveries are now coming forward rapidly on the large orders placed earlier in the season. Small orders for tank plates are fairly numerous, and while the tonnage is not as heavy as was expected, the movement is as large as usual at this season. There has been some delay in the placing of new contracts for fabrication, and the larger work in hand has already been provided for. The outlook is favorable for a large movement during the fall.

Rails.—No heavy tonnage of standard sections has been booked recently, the larger projects in hand being well provided for and very few new inquiries are coming into the market. Supplies of light rails in store are considered ample for all probable needs of the immediate future, as the jobbing demand for the last month has been of little consequence and no unusual activity is anticipated.

Bars.—The larger buyers are still inclined to hold off from the market or to order in a small way for early delivery, and the bulk of the business is of a jobbing nature. Small orders are fairly numerous, but the distributive movement is not sufficient to cause any material reduction of supplies on hand, which are augmented from time to time by arrivals of foreign material. The tonnage in store is not excessive, but is considered ample for current needs and merchants are buying on a very moderate scale. Bars for concrete reinforcing are in good demand, as there is considerable activity in concrete construction work, but this material is purchased in small lots as required. Jobbing prices are firmly held, bars from store, San Francisco, being quoted at 2.50c. for steel and 2.30c. for iron.

Structural Material.—The local situation is very quiet. Few contracts of any importance have been let recently, though figures are being taken on a number of jobs. Several of the smaller fabricators in San Francisco are fairly busy, but the bulk of the work is of a small nature and will soon be completed. A contract is expected shortly for the Realty Syndicate Building in Oakland, and the general contract has been awarded for the H. C. Capwell Building in that city, which will require about 600 tons. Milliken Bros. will fabricate 400 tons for the Oregon Railroad & Navigation Company, Portland, Ore. The American Bridge Company has a contract for a court house at Fairfield, Cal., about 200 tons. The contract is still withheld on the steel for the Bakersfield, Cal., court house. An inquiry has been received for about 300 tons for an art museum at Los Angeles, Cal. Specifications are being prepared for the Oakland City Hall, contracts for which will probably be let within four months. The Folsom Investment Company is planning a building at Sacramento, Cal., which will require about 150 tons. Awards are expected within a few days on a bank in the San Joaquin Valley and on the Masonic Temple at Fresno, Cal. A site has been selected for a national guard armory, for which a considerable tonnage will probably be required, and the Government is negotiating for a site for a \$180,000 federal building at Berkeley, Cal. A general contract has been let for a large steel frame theater building at San Diego, Cal. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Merchant Pipe.—The general movement of steel pipe during the month of July has been even smaller than for

the previous month, no tonnage of any consequence having been booked by any of the Eastern interests in this market. The movement of small sizes is almost entirely of a jobbing nature and the demand has not increased to any great extent, most orders being for carload lots or less. Some fair inquiries for small pipe, however, are coming from municipal water works projects. Local merchants have held aloof from the market since last November, when a heavy tonnage was ordered in anticipation of an advance, and no general buying movement is expected before the last quarter. A material increase of small business is expected before the end of September, but stocks on hand are considered ample to meet all demands until that time. The market in the oil fields remains extremely dull and the prospect of a revival before the rainy season is very doubtful. Existing wells are producing more oil than can be handled, causing a general suspension of new drilling operations, and plans for new pipe lines are progressing very slowly.

Cast Iron Pipe.—The tonnage booked during the past month is comparatively light, as is to be expected at this time of year. The general buying movement earlier in the season has provided for the principal requirements of the summer season, a fair tonnage having been ordered by most of the water and gas corporations of the coast, and inquiries at present are mostly for municipal water works, most of which are of small importance. Plans are under way, however, on quite a number of water works projects and there is considerable business in prospect. The Crane Company has taken a contract for a considerable tonnage for the town of Lodi, Cal., and there is an inquiry for a lot of 10 and 12 in. pipe for Phoenix, Ariz.

Pig Iron.—Most of the local foundries are operating on a small scale, as structural cast iron is in small demand, and current business in machinery castings occupies only a small proportion of the capacity. Several foundries are working on manhole covers, &c., in connection with street work, but their requirements are not heavy. As none of the local melters is inclined to carry any stock in excess of current needs this market remains in the same dull condition as for several months past, most orders consisting of small lots to be delivered from store. There is somewhat more activity at other coast points, especially in the North, but the principal requirements of that section are provided for by frequent arrivals of Chinese iron. Southern foundry iron is nominally valued at \$22.50, and foreign iron in small lots from store is quoted as follows: Chinese, \$23; Continental, \$23; English, \$23 to \$23.50; Scotch, \$24 to \$24.50. Lower prices could probably be obtained on large lots to arrive.

Old Material.—Shipping firms are buying up considerable steel melting scrap for shipment to Atlantic ports, an old steamer containing about 2200 tons being recently sold to be broken up for this purpose. Otherwise the market presents little feature. Accumulations of cast scrap are not excessive, and while there is no demand of any consequence prices are firmly maintained. Other descriptions are quiet. Prices are quoted as follows: Cast iron scrap, per gross ton, \$17; steel melting scrap, per gross ton, 10; railroad wrought scrap, per net ton, \$14; rerolling rails, per net ton, \$15.

Buffalo

BUFFALO, N. Y., August 2, 1910.

Pig Iron.—The market continues dull and the aggregate of sales for the week has been small, neither producers nor purchasers making much effort to do business. The larger proportion of the sales made have been to Eastern and New England points accessible for shipment via the Erie Canal, comprising principally foundry grades, in 100 to 200 ton lots. Sales for July show a total considerably under that for June. Prices are practically unchanged from last week. We quote as follows, per gross ton, f.o.b. Buffalo:

| | |
|----------------------|--------------------|
| No. 1 X foundry..... | \$15.00 to \$15.50 |
| No. 2 X foundry..... | 14.50 to 15.00 |
| No. 2 plain..... | 14.25 to 14.75 |
| No. 3 foundry..... | 14.00 to 14.50 |
| Gray forge..... | 14.00 to 14.50 |
| Malleable..... | 15.00 to 15.50 |
| Basic..... | 15.25 to 15.75 |
| Charcoal..... | 18.75 to 19.25 |

Finished Iron and Steel.—The total sales figures for finished products for the month of July, as reported by the principal agencies, are well up with June, making a very good showing for the midsummer month, the slight slackening off being attributable to the inventory period. In structural business there was a marked increase for the month, as compared with June. The market in bar material is quiet, but specifications on contracts continue in good volume and a fair amount of new business for the season is in evidence. In plates and shapes some good inquiries are being received, but purchasers are looking for concessions. The demand for fabricated structural material shows improvement. Bids have gone in this week for the 700 tons of

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material for a highway bridge over the Oswego River at Oswego, and figures will be taken next week for the steel for the new Manru Theatre on Broadway, Buffalo, about 175 tons, and for the Plaza Theatre, Buffalo, for a smaller tonnage. Plans and specifications are being prepared for a 10-story receiving and distributing warehouse for the Larkin Company, soap manufacturer, Buffalo, involving a heavy tonnage. The Buffalo Structural Steel Company was low bidder for the new Sherman House, Jamestown, N. Y., 862 tons; also for the State Normal School at Oswego, N. Y., 400 tons. The contract for steel for the addition to the Snow Building, Syracuse, went to the Syracuse Bridge Company.

Old Material.—There is but little inquiry for material in any line. A few sales have been made at sacrifice prices, but there has been no movement of important tonnage. Most dealers are holding their material rather than dispose of it at prices obtainable and are adding to their stocks such as can be secured at low prices. We quote as follows per gross ton, f.o.b. Buffalo, prices being largely nominal:

| | |
|--|--------------------|
| Heavy melting steel..... | \$13.25 to \$13.50 |
| Low phosphorus steel..... | 17.50 to 18.00 |
| No. 1 railroad wrought..... | 14.00 to 14.50 |
| No. 1 railroad and machinery cast scrap..... | 13.25 to 13.50 |
| Old steel axles..... | 17.50 to 18.00 |
| Old iron axles..... | 22.00 to 22.50 |
| Old car wheels..... | 14.00 to 14.50 |
| Railroad malleable..... | 13.75 to 14.25 |
| Boiler plate..... | 11.25 to 11.50 |
| Locomotive grate bars..... | 11.00 to 11.50 |
| Pipe..... | 11.00 to 11.50 |
| Wrought iron and soft steel turnings..... | 6.50 to 7.00 |
| Clean cast borings..... | 5.50 to 6.00 |
| No. 1 bushing scrap..... | 11.75 to 12.00 |

New York

NEW YORK, August 3, 1910.

Pig Iron.—Some sellers appear to be making more effort to get business and prices have yielded further. On Southern iron \$11, Birmingham, for No. 2 foundry has been done, and it is reported that one or two Virginia irons have been offered as low as \$13 at furnace, though \$13.25 and \$13.50 are maintained by other sellers. Several orders for fair size have been booked, Southern and Northern irons sharing the business. A Brooklyn buyer took 1000 tons for delivery in the balance of the year, and a transaction of similar size is reported from Connecticut. Business in 200, 300 and 500-ton lots has been done at Hudson River points and at foundry centers in central and eastern New York. This is not so much the result of inquiries on which there has been competitive bidding, for inquiries have grown less, but rather comes from attractive offers made by furnaces. More business has been done in this district by Buffalo furnaces on the basis of \$14.50 at furnace for No. 2. We quote Northern foundry iron at tidewater as follows: No. 1, \$16.25 to \$16.50; No. 2 X, \$15.75 to \$16; No. 2 plain, \$15.50 to \$15.75. On Southern iron quotations are \$15.75 to \$16 for No. 1 and \$15.25 to \$15.75 for No. 2.

Finished Iron and Steel.—The West shows most activity in new structural work. While a number of contracts have been taken by fabricators in that section, Eastern business has fallen off. The New York Central terminal work in this city has not yet been let. It is understood the competition is quite sharp, in view of the large tonnage involved. The principal new business taken in New York City was the steel for three new school buildings, amounting to 2000 tons. The American Bridge Company will fabricate the steel for a new foundry building for the Dean Steam Pump Company, Holyoke, Mass., 300 tons. A new bakery and garage at 165th street and Park avenue, this city, 350 tons, will be erected by the Hay Foundry & Iron Works. New railroad bridge work is unimportant. In Ohio the King Bridge Company, Cleveland, has taken 350 tons, awarded by the Cincinnati, Hamilton & Dayton. While the large fabricators have business enough to carry them well along in the year they are keeping a close watch on new developments, July showing the smallest total of new tonnage for the year at 100,000 tons, of which the leading interest took about 30,000 tons. While the volume of business in both steel and iron bars is quite satisfactory for the season, competition is keen and prospective buyers are vigorously canvassed for the orders which are now being placed. The plate trade is not active, but there is some prospects for business of fair size in the boat building line. Quotations are as follows: Plain structural material and plates, 1.61c. to 1.66c.; steel bars, 1.56c. to 1.61c.; bar iron, 1.45c. to 1.50c., all New York.

Cast Iron Pipe.—The Washington, D. C., contract for 5000 tons, referred to in last week's report, was awarded July 27 to a Virginia foundry, as had been anticipated. The most important letting now coming up in Eastern cities is at Boston, August 9, when bids will be received on 500 tons of 30-in. water pipe. The general market is almost

lifeless, inquiries being very light. Carload lots of 6-in. are quoted at \$23.50 to \$24 per net ton, tidewater.

Ferroalloys.—There is but little call for ferromanganese. The price is about \$39.50, Baltimore, and quotations for next year's delivery are around \$40. An error was made in last week's report, the quotation of \$39 having been at seaboard. The price for 50 per cent. ferrosilicon is from \$57.50 to \$58, delivered Pittsburgh, and but little trading is being done.

Old Material.—Business is decidedly quiet, but this condition of the trade is partly due to the refusal of many dealers to sell their holdings at current prices. They say that they are unable to replace their stock from makers of scrap who are unwilling to take the offers now being made. The railroad lists now going out are quite heavy, but it would not be surprising if some companies refused to sell at the bids they will get. All the railroads are complaining of the low prices they are receiving for old material. Wrought pipe is probably most in demand of any class of scrap, which is owing to the fact that the supply is light, while the material is desirable. Foundries are making only limited purchases of cast scrap. Quotations per gross ton, New York and vicinity, are nominal, as given below, but it is likely that buyers in actual need of material may be obliged to pay somewhat higher prices.

| | |
|---|--------------------|
| Rerolling rails..... | \$12.50 to \$13.00 |
| Old girder and T rails for melting..... | 11.00 to 11.50 |
| Heavy melting steel scrap..... | 11.00 to 11.50 |
| Relaying rails..... | 20.00 to 21.00 |
| Standard hammered iron car axles..... | 21.50 to 22.00 |
| Old steel car axles..... | 17.50 to 18.00 |
| No. 1 railroad wrought..... | 13.25 to 13.75 |
| Wrought iron track scrap..... | 11.50 to 12.00 |
| No. 1 yard wrought, long..... | 11.50 to 12.00 |
| No. 1 yard wrought, short..... | 11.00 to 11.50 |
| Light iron..... | 5.00 to 5.50 |
| Cast borings..... | 7.50 to 8.00 |
| Wrought turnings..... | 8.50 to 9.00 |
| Wrought pipe..... | 11.75 to 12.25 |
| Old car wheels..... | 12.50 to 13.00 |
| No. 1 heavy cast, broken up..... | 11.50 to 12.00 |
| Stove plate..... | 9.00 to 9.50 |
| Locomotive grate bars..... | 9.00 to 9.50 |
| Malleable cast..... | 12.00 to 12.50 |

Metal Market

NEW YORK, August 3, 1910.

THE WEEK'S PRICES

| | | Copper. | | Lead. | | Spelter. | |
|---------|--------|----------------|-------|-----------|------------|-----------|------------|
| | | Electro-lytic. | Tin. | New York. | St. Louis. | New York. | St. Louis. |
| July. | Lake. | | | | | | |
| 28..... | 12.62½ | 12.50 | 32.25 | 4.45 | 4.30 | 5.20 | 5.05 |
| 29..... | 12.75 | 12.50 | 33.00 | 4.45 | 4.30 | 5.20 | 5.05 |
| 30..... | 12.75 | 12.50 | 33.00 | 4.40 | 4.25 | 5.20 | 5.05 |
| August. | | | | | | | |
| 1..... | 12.75 | 12.50 | 33.50 | 4.40 | 4.25 | 5.20 | 5.05 |
| 2..... | 12.75 | 12.50 | 33.35 | 4.40 | 4.25 | 5.20 | 5.05 |
| 3..... | 12.75 | 12.50 | 33.20 | 4.40 | 4.25 | 5.20 | 5.05 |

The buying movement in copper continues and some sellers have disposed of all their stocks for immediate delivery. Tin statistics, showing unusually heavy deliveries for June and July, have greatly strengthened that market. Lead is a little easier. Spelter is attracting no attention from buyers, but prices are firm.

Copper.—Some large sales of copper were made during the week, with the result that prices have stiffened and quotations for September deliveries have advanced to 12.62½c. for electrolytic. It is generally believed that most copper producers have of their own accord curtailed their production, and there are enough reports of shutdowns at some of the mines for repairs to indicate that production is being lessened. There has been a very good call for copper for spot delivery, and last Thursday outside sellers who were offering electrolytic at 12.37½c. advanced their price to that established by the United Metals Selling Company, which was 12.50c. To-day copper was even stronger than yesterday and sales of electrolytic were made at 12.62½c., delivered in the Naugatuck Valley, cash in 30 days. It is evident that many consumers of copper have let their stocks run down, as most of the buying that has been done the past week has been for immediate delivery. Lake copper is higher and cannot be had for less than 12.75c. The price for spot electrolytic in New York is 12.50c. and casting copper is firm at 12.37½c. The August statistics on copper, compiled by C. Mayer, secretary of the Metal Exchange, show that the exports during the month were fair, amounting in all to 22,875 tons. The total exports for the seven months of this year show a decrease of 30,427 tons, compared with the same period of last year. In London to-day the market closed with spot copper selling for £55 8s. 9d. and futures for £56 2s. 6d. The sales amounted to 500 tons of spot and 1400 tons of futures. The market was dull.

Waterbury Average.—The Waterbury average for July was 12.75c.

Pig Tin.—The tin statistics for July, compiled by the

THE IRON AND METAL MARKETS

New York Metal Exchange, were astonishing, as the combined deliveries of June and July were more than the deliveries of any two consecutive months in the history of the trade. The deliveries in July alone amounted to 3800 tons, and the total for the seven months of the year shows an increase of 7900 tons, compared with the same period last year. The total visible supply, July 31, was 2811 tons below that of July 31, 1909. It is very certain that a large amount of tin delivered last month did not go into consumption, but, nevertheless, the fact that the market in spot tin is still cornered is taken as an indication that the demand is unusually good. A good business has been done in the New York market since last Friday, and the sales were mostly to consumers. The arrival of the steamer Minnewaska, August 1, with 980 tons of tin, has not given any special relief, as most of the cargo had been taken care of and the tin available for early consumption in New York is still cornered. Since early last week the Minnewaska tin to arrive had been traded in, and the price varied from 10 to 15 points less than the spot price, until August 1, when tin in the warehouse and tin on board the steamer were quoted at 33c. August 1 was a holiday in London and sellers here were in the dark as to how the English traders might take the American statistics. Consequently on the following day, when the London market opened at a much higher price, the price for spot tin in New York was advanced $\frac{1}{2}$ c. and yesterday it receded to 33.25c. Spot tin was sold in New York to-day for 33.20c. The London market closed to-day with spot tin selling at £151 and futures at £151 7s. 6d. Sales amounted to 150 tons of spot and 1000 tons of futures. The market was dull.

Tin Plates.—The demand is rather quiet, but it is still somewhat difficult to get early deliveries. The price in New York for 100-lb. coke plates is \$3.84. Following a sharp advance in the price of pig tin, quotations on tin plates at Swansea, Wales, were advanced $\frac{1}{2}$ d. to-day, and the price now is 13s. 6d.

Lead.—Lead is somewhat easier. On July 28 and 29 outside sellers advanced their price to 4.50c., and it was strongly rumored that the leading interest was preparing to advance its price five points. As the week went by and no action was taken in this direction the market became easier, and at present outside sellers are getting the price asked by the American Smelting & Refining Company, which is 4.40c., New York. The price in St. Louis is 4.25c., and the market there is reported to be firmer than the New York market.

Spelter.—Spelter for spot delivery is still scarce in New York, but that is affecting only the jobbing trade, as larger buyers have ample assurance that they can get all the metal they need shipped from East St. Louis within a very short time, and they are making their purchases accordingly. Very little interest is being taken in the market by consumers, and the nominal price remains unchanged at 5.25c., New York, and 5.05c., St. Louis.

Antimony.—The antimony situation is uninteresting. Prices are weak and there are reports that the standard brands are being offered at shaded prices. The nominal price for Cookson's is 8.25c. and Hallett's 8c. Lesser known brands of antimony are being sold at all sorts of prices from 7.50c. up.

Old Metals.—Under an improved demand copper and brass prices are higher. Dealers' selling prices are as follows:

| | Cents. |
|-------------------------------------|----------------|
| Copper, heavy cut and crucible..... | 12.25 to 12.50 |
| Copper, heavy and wire..... | 11.75 to 12.00 |
| Copper, light and bottoms..... | 11.00 to 11.25 |
| Brass, heavy..... | 8.75 to 9.00 |
| Brass, light..... | 7.00 to 7.25 |
| Heavy machine composition..... | 11.25 to 11.50 |
| Clean brass turnings..... | 8.00 to 8.25 |
| Composition turnings..... | 9.50 to 9.75 |
| Lead, heavy..... | 4.05 to 4.20 |
| Lead, ten..... | 3.80 to 3.95 |
| Zinc scrap..... | 4.15 to 4.25 |

Metals, Chicago, August 2.—The discussion of restricting the output of copper has led large consumers to buy heavily the past week, and as a result prices are quoted higher on both casting and lake copper in this market. Spot tin is still quoted at 34c., but for shipment after August 10 this metal is quoted a half cent lower. Lead is stronger, but the leading interest has not changed its price. Spelter is practically unchanged, with very little business being done. We quote Chicago prices as follows: Casting copper, 12 $\frac{1}{2}$ c.; lake, 13c., in carloads, for prompt shipment; small lots, $\frac{1}{4}$ c. to $\frac{3}{4}$ c. higher; pig tin, car lots, 34c.; small lots, 35c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2 $\frac{1}{2}$ c. per 100 lb. higher; spelter, 5.15c. to 5.20c.; Cookson's antimony, 10 $\frac{1}{4}$ c., and other grades, 9c. to 10c.; sheet zinc is \$7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12 $\frac{1}{4}$ c.; copper bottoms, 10 $\frac{1}{4}$ c.; copper clips, 11 $\frac{1}{4}$ c.; red

brass, 11 $\frac{1}{2}$ c.; yellow brass, 8 $\frac{3}{4}$ c.; light brass, 6c.; lead pipe, 4 $\frac{1}{4}$ c.; zinc, 4 $\frac{1}{2}$ c.; pewter, No. 1, 24c.; tin foil, 28c.; block tin pipe, 30c.

Metals, St. Louis, August 1.—Lead is quiet at 4.30c. to 4.35c.; spelter is in moderate demand at 5c. to 5.05c., both at East St. Louis. Zinc ore is held at \$38 to \$39 per ton, Joplin base. Tin is quoted at 33.35c. per pound; antimony, 8.50c.; Lake copper, 13.15c.; electrolytic, 12.97 $\frac{1}{2}$ c., all at St. Louis. The demand for finished metals is slower and rounded up for the past week only a fair average.

Iron and Industrial Stocks

NEW YORK, August 3, 1910.

The lowest prices of the downward movement in the stock market which was in progress at the date of last week's report were reached on Wednesday. A reaction from the decline started on Thursday, which was continued with much strength on Friday, but prices again receded on Saturday, largely influenced by rumors of a reduction in the dividend on an iron stock. This appeared to chill the ardor of those operating for higher prices, and until Tuesday the market was dull, with recessions in some securities, but on that day an upward movement occurred. The range of prices on active iron and industrial stocks from Wednesday last week to Tuesday this week was as follows:

| | | | |
|-----------------------|---------------------------------------|----------------------|-------------------------------------|
| Allis-Chalm., com... | 8 - 9 | Pressed St., com... | 26 $\frac{1}{2}$ - 30 |
| Allis-Chalm., pref... | 28 | Pressed St., pref... | 90 - 91 $\frac{1}{2}$ |
| Beth. Steel, com... | 22 - 24 $\frac{1}{2}$ | Railway Spr., com... | 28 - 30 $\frac{1}{2}$ |
| Can, com..... | 7 $\frac{1}{2}$ - 8 $\frac{1}{2}$ | Republic, com.... | 28 - 31 $\frac{1}{2}$ |
| Can, pref..... | 63 $\frac{1}{2}$ - 67 | Republic, pref.... | 84 - 90 |
| Car & Fdry, com... | 41 $\frac{1}{2}$ - 46 $\frac{1}{2}$ | Sloss, com..... | 40 - 57 $\frac{1}{2}$ |
| Car & Fdry, pref... | 109 - 109 $\frac{1}{2}$ | Pipe, com..... | 14 $\frac{1}{2}$ - 16 $\frac{1}{2}$ |
| Steel Foundries... | 39 - 43 $\frac{1}{2}$ | Pipe, pref..... | 53 $\frac{1}{2}$ - 54 |
| Colorado Fuel.... | 24 $\frac{1}{2}$ - 27 $\frac{1}{2}$ | U. S. Steel, com... | 63 $\frac{1}{2}$ - 69 $\frac{1}{2}$ |
| General Electric... | 135 $\frac{1}{2}$ - 141 $\frac{1}{2}$ | U. S. Steel, pref... | 112 $\frac{1}{2}$ - 116 |
| Gr. N. ore cert.... | 49 $\frac{1}{2}$ - 54 | Westinghouse Elec. | 52 $\frac{1}{2}$ - 56 $\frac{1}{2}$ |
| Int. Harv., com... | 86 $\frac{1}{2}$ - 89 $\frac{1}{2}$ | Am. Ship, com.... | 70 - 80 |
| Int. Harv., pref... | 118 | Am. Ship, pref.... | 108 |
| Int. Pump, com... | 38 $\frac{1}{2}$ - 40 $\frac{1}{2}$ | Cambria Steel.... | 41 $\frac{1}{2}$ - 42 |
| Int. Pump, pref... | 78 $\frac{1}{2}$ - 79 $\frac{1}{2}$ | Lake Sup. Corp... | 17 $\frac{1}{2}$ - 17 $\frac{1}{2}$ |
| Locomotive, com... | 30 $\frac{1}{2}$ - 36 $\frac{1}{2}$ | Warwick..... | 9 $\frac{1}{2}$ |
| Locomotive, pref... | 103 - 105 | Crucible St., pref.. | 72 - 73 |
| Nat. En. & St.com. | 15 $\frac{1}{2}$ - 16 $\frac{1}{2}$ | | |

Dividends.—The American Shipbuilding Company has declared a regular annual dividend of 4 per cent. on the common stock and 4 per cent. extra. The dividends will be payable 2 per cent. quarterly, beginning September 1. This distribution is from the earnings of the company in the fiscal year ended June 30, 1910.

The Pressed Steel Car Company has declared the regular quarterly dividend of 1 $\frac{1}{4}$ per cent. on the preferred, payable August 24.

The American Radiator Company has declared the regular quarterly dividend of 1 $\frac{1}{4}$ per cent. on the preferred and 2 per cent. on the common. The preferred dividend is payable August 15, the common September 30.

The German Iron Market

BERLIN, July 22, 1910.

The event of chief present interest to the iron market is the advance in the price of coke, which was voted by the Coal Syndicate several days ago. The advance had been proposed above a month ago and was much discussed at that time. It was then believed in the iron trade that the syndicate would desist from such action in view of the energetic protests of such furnaces as are operated independently of steel works. Most of these establishments, it is claimed by their owners, are already being operated at a loss, and their contracts for the rest of the year were taken on the basis of coke prices as already existing. Now the syndicate has added 1.50 marks (35.7 cents) per ton on blast furnace coke (1 mark on other qualities), to take effect October 1. The original proposal was to add 2 marks, but the syndicate thought it might take account of the furnacemen's protests by throwing off $\frac{1}{2}$ mark of the intended advance.

The Pig Iron Syndicate

The market has been discussing what effect this action will have on the negotiations now in progress for the reorganization of the pig iron trade. On the stock market it is believed that the rise will cause the isolated furnaces to lend a more willing ear to the proposals of the concerns that are pushing for a combine. Those disconnected furnaces will evidently be harder hit by the increased price of coke than furnaces connected with big steel companies, which all make their own coke and can well be indifferent to the price of that commodity. Indeed, it was asserted in the trade press that these big companies of mixed production were the chief movers for the marking up of the price, since this action would still further aggravate the precarious position of the independents without at the same time doing themselves any harm.

The Machinery Markets

Machine tool builders have recently received an unusual number of cancellations of orders from the automobile manufacturers of the Middle West. As many of the machinery people, whose product is an important factor in that industry, are far behind in their orders, a reasonable percentage of cancellations would not be unacceptable. They would welcome the opportunity to accumulate stocks. The incident is emphasizing the necessity of a noneancellation clause in machinery contracts. The volume of business booked from miscellaneous New England industries is encouraging; the variety of product represented by buyers appears to be on the increase, and their total bookings, apart from the automobile industry, are holding their own. In the New York district many houses did a better business in July than they did in June. Strong expectations are warranted of a good deal of new business coming along in the fall, but from present indications it will be necessary to look in other directions to make up for a falling off in the demand for machinery from the automobile trade. It is reported in the Pittsburgh district that the outlook for the fall trade has seldom been better, and there is already a marked improvement in buying. In that territory some companies are experiencing difficulty in placing bonds in part payment for new equipment. There is enough business in sight in Detroit to warrant the belief that August will be a strong month there, and many new building projects are under way. In Milwaukee a heavy fall trade is expected, and a good business is being done by manufacturers of machine tools and foundry equipment. An indication of the trend in St. Louis is contained in the report that a leading babbitt metal manufacturer there states that his July business shows an increase of 30 per cent. over the corresponding month of 1909. In Chicago some good railroad lists are expected shortly, but the immediate business is rather dull. The machine tool business in Philadelphia is fairly good, but there is not much in sight for the immediate future. In Cincinnati most manufacturers have their plants running on full time, although the machine tool business there is rather easy and a similar condition exists in Cleveland. Trade is very quiet in the South and Southwest. In the Northwest a great deal of development work is going on, and manufacturers of hydroelectric equipment are especially busy. A big business is reported on the North Pacific Coast, and some good trade is coming into that market from Alaska.

New York

NEW YORK, August 3, 1910.

The machinery trade in the Manhattan territory is more quiet, but there is some good business in sight. The business done during the last week was largely in filling small orders for replacements. A number of New York machinery houses find in going over their books that July was one of the best months in the year, and most of the New York representatives of machinery manufacturers did more business in July than they did during the month of June. The New York Central Railroad has been placing a few orders against the list it issued about two weeks ago, but other railroads have been inactive as far as machinery buying is concerned. The list issued by the Delaware, Lackawanna & Western Railroad for its Scranton shops has not been closed yet, and it is understood that the mechanical department at Scranton has not decided on all the machinery that will be required. Manufacturers of small power equipment, including electric generating sets, are doing more business just now than they had been looking for. This is largely due to the fact that the building season this year was rather slow, as a great many construction projects were held in abeyance because of the uncertainty in the real estate market. A great many office buildings and large apartment houses which have been erected in the vicinity of New York during the spring and summer are now being prepared for occupancy, and in many cases the purchasing of small power units has been left until the last moment; consequently a fair amount of unexpected business is coming from that source. Iron and steel foundries which make a specialty of furnishing steel castings for machinery manufacturers are fairly busy in filling orders. It is stated in the trade that there is not as much new business in sight as there was in the spring, but most of them have enough to do to keep their plants filled up with work.

It is expected that within the next month a list of machine tools and other equipment will be prepared for the proposed new Manual Training and Commercial High School to be erected in Newark, N. J. The plans for the structure have been approved and the construction work is under way. It is proposed to equip a foundry and forge room, a machine shop, pattern shop, woodworking shop and sheet metal working department. Mr. Pickwick, who is connected with the manual training department of the Newark schools, with headquarters in the City Hall, has charge of the machinery details.

The W. A. Wood Auto Company, Kingston, N. Y., may shortly be in the market for a line of machine tools for the

manufacture of automobile trucks. This company some time ago acquired the plant of the Peckham Mfg. Company at Kingston, and lately it has been disposing of some of the railroad car manufacturing equipment which the former owner used. It is understood that this machinery is to be replaced with machine tools.

The Universal Caster & Foundry Company, 574-600 Ferry street, Newark, N. J., will not be ready to purchase the equipment for its proposed new plant within 30 days or more, according to the engineer in charge. The company proposes to erect a building which will contain approximately 190,000 sq. ft. of floor space, and it is expected that the structure will be completed by next February.

The Compton Shear Company, Newark, N. J., is about to increase its manufacturing facilities by the erection of a three-story factory, plans for which have been prepared by Nathan Myers of Newark. Two years ago this company erected a grind and forge shop for which machinery equipment was purchased in the New York market, and at the time sufficient power was installed to take care of the proposed addition.

J. L. Cohagan, Washington, Pa., and W. W. Smith, Wheeling, W. Va., who are connected with the Railway Brake & Shoe Company, are arranging to establish a plant at Moundsville, W. Va., for the manufacture of brake shoes for steam and electric railroads. The brake shoes are to be made under new patents and are to be composed of malleable iron shells filled with a composition. It is proposed to erect a one and two story brick building, 80 x 100 ft., at a cost of \$10,000, and equipment costing about \$20,000 will be installed. Mr. Cohagan can be addressed at Washington, Pa.

The Turner Construction Company, New York, has been awarded a contract for erecting a reinforced concrete factory building for the Bush Terminal Company at Brooklyn. It will be an eight-story structure, 230 x 440 ft. The same company will build a reinforced concrete factory at Buffalo, N. Y., for the Alling & Cory Company of Rochester, N. Y. It will be an L-shaped structure, 65 x 153 ft., with a wing 53 x 117 ft. Both buildings are to be six stories in height.

The Larkin Company, Buffalo, manufacturer of soaps, perfumes and toilet preparations and an extensive line of premiums, will erect a receiving and distributing building, 10 stories and basement, 100 x 600 ft., at Van Rensselaer and Exchange streets and the Erie Railroad, adjoining its present mammoth plant, the largest in Buffalo, at Seneca, Larkin and Van Rensselaer streets. The new building will be of steel frame and brick construction, with concrete floors.

The Industrial Bureau, Niagara Falls, Ont., announces that the Hawes-von Gal Hat Company of Danbury, Conn., has decided to build a manufacturing plant in that city at Clifton avenue and Queen street.

THE MACHINERY MARKETS

D. Dick & Sons, Welland, Ont., have secured contract for the building of the extensive Canadian plant of the Oliver Chilled Plow Company at Hamilton, Ont., and construction work will be commenced at once.

The Star Electric Company, Binghamton, N. Y., has been incorporated, with a capital of \$300,000, to manufacture electric appliances and electric supplies.

The Federal Motor Company, Buffalo, E. E. Denniston, president, West Mohawk and Staats streets, is having plans prepared for a four-story and basement factory for the manufacture of auto trucks and commercial vehicles.

The Stahlbrodt Company has been incorporated at Rochester, N. Y., with a capital stock of \$25,000, to manufacture wind shields and other appliances for automobiles, air craft and other power machines. The incorporators are L. C. Stahlbrodt, A. M. Grewer and R. B. Griffin.

The Stevens Mfg. Company has been incorporated at Rome, N. Y., to manufacture carbureters, motor and automobile supplies. S. B. Stevens and A. L. McAdam, Rome, are among the incorporators. Capital stock, \$50,000.

The Northeastern Forestry Company, New Haven, Conn., will add curing and drying buildings to its plant at Wellsboro, N. Y.

The Jacob Dold Packing Company, Buffalo, has let contract to the Turner Construction Company for the erection of a concrete and steel reservoir and tank building at its plant, William and Howard streets and New York Central Railroad.

The Keystone Mfg. Company, Buffalo, manufacturer of wrenches, is building a two-story and basement warehouse and office building at its plant on Chandler street.

Catalogues Wanted

Francis B. Atkinson, 4939 Vincennes avenue, Chicago, would like to receive catalogues of machinery and supplies, as he and associates contemplate the erection of a plant for the manufacture of machinery.

Chicago

CHICAGO, ILL., August 2, 1910.

August promises to be a duller month than July in the Chicago machinery market, but this does not cause any concern to dealers, as they have expected a dull summer season. There are occasional sales of machines to individual buyers and there are also a few inquiries for second-hand machines, but no large transactions are expected until the fall trade picks up. It is believed, however, that the Chicago, Burlington & Quincy Railroad will close in the near future on its list for the Havelock shops, as these shops are now practically completed and ready to install the necessary tools. In other directions railroad buying is very light. There is a difference of opinion whether the policy now followed by the railroads is the result of business necessity which makes them restrict their purchases to the lowest possible limit, or whether they are following a shrewd political policy of doing all that they can to keep the business of the country in a dragging state until they secure approval for a general advance in rates. In any event, the purchasing agents are working under strict orders not to do any buying that can be postponed until November.

The Ross Gear & Tool Company, La Fayette, Ind., has increased its capital stock from \$50,000 to \$100,000 and is contemplating the erection of a main factory building of sufficient size to handle its increasing volume of business.

The F. A. L. Motor Company, Chicago, has increased its capital stock from \$200,000 to \$900,000. The company advises that the increase is to be used for extra working capital and that it does not contemplate adding new equipment of any consequence.

P. E. Kroehler, president of the Naperville Lounge Company, Naperville, Ill., advises that he will start a factory at Kankakee, Ill., for the manufacture of davenport, couches, Morris chairs, &c.

The Economy Motor Car Company, Joliet, Ill., which has recently passed under control of new owners, is negotiating with outside interests with a view to expanding its manufacturing facilities.

The plant of the Thomas Brass & Iron Company, Waukegan, Ill., was destroyed by fire on the morning of July 26. The company will hold a meeting of its directors, at which time it will be decided whether the plant is to be rebuilt. The plant of the Durand Steel Locker Company, adjoining the plant of the Thomas Brass & Iron Company, was also destroyed.

Joseph H. Whitehead, 12 North Jefferson street, Chicago, machinists' supplies, has secured the agency in the Chicago territory for the Lutz file handle, manufactured by the Lutz File Company, Cincinnati, Ohio. The company will also act

as agents for L. M. Tague, Kokomo, Ind., manufacturer of aluminum solder, in Wisconsin, Illinois and Iowa.

The Excelsior Motor & Mfg. Company, Chicago, has increased its capital stock from \$60,000 to \$250,000, for the purpose of increasing its working capital.

The Chicago & Alton Railroad Company has awarded a contract to Westinghouse, Church, Kerr & Co. of New York City for the enlargement of its shops at Bloomington, Ill., and the construction of a new depot. Officials of the company recently entered into an agreement with the city to expend \$1,000,000 in improvements in consideration of the transfer by the city of Bloomington of land upon which to erect the new buildings and yards valued at \$165,000.

The Chicago & Northwestern Railroad has awarded a contract to J. J. Jobst of Peoria, Ill., for the construction in its Fulton terminal yards at Belvidere, Ill., of a power house, 100 x 110 ft., which is to be equipped with a battery of five 150-hp. boilers.

The Ft. Wayne Box Company, Ft. Wayne, Ind., has increased its capital stock from \$100,000 to \$140,000. W. W. Rockhill is president of the company.

C. S. Workinger, formerly secretary-treasurer of the Sibley Machine Tool Company, South Bend, Ind., has purchased the Edward Kelley foundry at Elkhart, Ind., and with C. G. Kibbe of Elkhart will organize a company with \$200,000 capital stock. It is planned to make extensive additions and improvements.

Fire July 28 destroyed the main building of the Monarch Iron Works, Plymouth, Ind., with \$10,000 loss. There was \$4000 insurance.

The Loshbough & Jordan Tool & Machine Company has been incorporated at Elkhart, Ind., with \$5000 capital stock. The directors are J. E. Loshbough, R. M. Loshbough, J. C. Jordan and M. M. Jordan.

The Chicago & Northwestern Railroad Company is erecting at the intersection of its tracks and Fortieth avenue, Chicago, a machine shop 200 x 300 ft., one story. G. A. Johnson & Son, 1335 North Clark street, Chicago, are the general contractors.

The Velle Engineering Company, Moline, Ill., has awarded a contract for the construction of a plant for the manufacture of gasoline engines, 80 x 400 ft., to the Leonard Construction Company, Chicago.

Philadelphia

PHILADELPHIA, PA., August 2, 1910.

With the majority of manufacturers and merchants the month of July was dull. In very few instances has the volume of business transacted been equal to that of June, and with quite a few sales have fallen below the usual average for July. The apathetic condition of the railroads and restricted buying by the large industrial concerns, few of which are operating up to their full productive capacity, have been factors. The usual midsummer inactivity has also had a quieting influence on trade generally. Business during the week has been of the ordinary character, scattered sales of one or more tools, with an occasional larger order, making up the bulk of the business. Merchants report transactions confined principally to the smaller classes of equipment, but the demand on the whole drags. There is no fresh railroad business offered, and pending business for any large proposition in the way of general shop equipment shows little indication of an early development into orders. Machine tool builders are, as a rule, comfortably fixed as far as business on hand, sufficient to keep plants fairly active for the next three to six months, is concerned. They are, however, catching up on some classes of work, and in a number of instances better deliveries than were offered a few months ago are to be had. With deliveries improving prospective buyers show no haste in placing orders. There has been some further locomotive business placed, and the local builder now reports order books in very satisfactory shape.

The demand for second-hand engines, boilers and machine tools generally continues rather inactive. Both iron and steel castings are in better supply, foundries not being so actively engaged.

The outlook for business during August is not particularly good, conflicting conditions influence the trade in many instances, and little active betterment in the situation is looked for before early fall.

The Sharpless Separator Company, West Chester, Pa., confirms the purchase of a site, corner Washington and Jefferson streets, Chicago, on which it will erect a fireproof building during the next 12 months. It is not the intention to do any manufacturing in Chicago; the proposed building will be used as a general Western office and storehouse. Definite plans have not been decided upon, but the building will be eight or ten stories.

The Emporium Water Company, Emporium, Pa., will

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receive bids until August 20 for the construction of a reservoir and the laying of about three miles of 12-in. cast iron water pipe. Plans and specifications may be obtained on payment of a small guarantee for safe return, on application to the company.

The Chadwick Engineering Works, Pottstown, Pa., states that its machine hands walked out July 26. No grievance had been presented on July 30, and it is presumed that the men walked out owing to the installation of a piece-work system.

Appropriations for a large amount of municipal work were authorized by City Councils a few days ago. Among the items were \$300,000 for the completion of the Northeast high pressure fire system and \$50,000 for bridge repairs. No funds for strictly new work were appropriated.

The Philadelphia & Reading Railroad has had plans prepared for a four-track stone and concrete bridge crossing the Delaware River at Yardley, Pa. This is in connection with the plan to four-track the system from Philadelphia to New York.

Fire partially destroyed the old general storehouse of the Germantown Tool Works in this city July 28. As a large portion of the materials contained therein had been removed to a new building, the inconvenience to the operation of the plant was small, and deliveries on orders will be but slightly interfered with.

The Betts Machine Company, Wilmington, Del., has recently shipped an extra heavy 20-ft. boring and turning mill to the Mesta Machine Works, Pittsburgh, Pa. The machine weighed complete about 370,000 lb. While some irregularity in the volume of new business taken by the Betts Company is reported, a good volume of business is on its books, sufficient to maintain the plant in full operation for the next three months. The outlook for the future is considered problematical, owing to conflicting existing conditions.

A number of contractors are estimating on a group of 21 buildings of various characters, comprising new shops for the Pennsylvania Railroad Company, to be erected in connection with improvement work at Northumberland, Pa.

The Baldwin Locomotive Works denies the current report that its boiler making department would be moved from this city to Burnham. The reported difficulties with molders at its Eddystone plant were of small consequence and easily adjusted. The Baldwin Works is quite busy and has recently booked an order for 35 engines of the consolidation type from the Illinois Central Railroad, for comparatively early delivery.

W. Vernon Phillips and Jacob M. Shenk, receivers of the Iron & Steel Products Company, announce that in connection with the sale of the entire plant, machinery and equipment, on August 16, of the Canton Iron & Steel Company, bankrupt, Baltimore, Md., by order of O. Parker Baker, trustee, they will, as receivers, also dispose of the personal property of the company, comprising bar iron, scrap iron and supplies, at the same time and place.

The American Viscose Company, Marcus Hook, Pa., which will engage in the manufacture of artificial silk, understood to be made from wood pulp, is progressing rapidly with its new plant. It is stated that the buildings, drains, reservoirs, filter beds, &c., will cost about \$250,000, while \$150,000 will be expended for machinery and equipment, a considerable amount of which will be brought from abroad. The motive power will probably be electricity, although no authoritative information is obtainable.

New England

BOSTON, MASS., August 2, 1910.

Those New England machine tool builders, a large percentage of whose current business is from the automobile manufacturers, are receiving notices to cancel orders running into considerable totals. This movement started some 10 days ago. Manufacturers of automobile parts are not troubled greatly with cancellations, but in the same period they have been asked by some of their important customers in the automobile trade to hold up on deliveries for the present. The matter is not so serious as would appear at first thought. The types of machines affected are practically out of the market because of the enormous bookings by this one industry, which have forced deliveries well into the future. Cancellations mean a relief from a strain of production which is abnormal, and may permit deliveries of such tools as milling machines, grinders, screw machines, the automatics and more or less special types, to return to a position where other classes of buyers will have a fair chance. The demand may be equalized both as to customers and as to machinery.

Another factor is the possibility that high class mechanics who have been attracted to the Middle West by the high

wages offered may be induced to return to New England, where they would be quickly absorbed.

Doubt is expressed, however, of the permanency of the movement as indicated by the cancellations. There may have been an overproduction of pleasure cars; report has it that some of the Middle West builders have manufactured more than the market could absorb. Banking interests have become more conservative in accepting the commercial paper of the trade.

The collective statement of an increased production for 1911 is accepted with reserve. Nevertheless, the belief exists, with good reason, that the automobile people will be excellent customers during the next 12 months, but with a lesser amount of what may be termed speculative orders. Some of the great establishments have made contracts with such utter disregard of cost as to attract criticizing attention. Machinery manufacturers have declined some of this business, and have taken certain orders only after a clause had been inserted in the contracts providing for a cash penalty for cancellation. The general opinion is that if the elimination process has started in the industry the results will be healthful to business in general.

The experience is an emphatic object lesson in the necessity of a non-cancellation clause in machine tool contracts. A splendid optimism in the automobile business, the outcome of great profits, an enormous demand, and the liberal backing of the banks, have led in some cases to a reckless disregard of the cost of anything which would lead to increased production. To-day some of these orders are being canceled in the face of very decided protests on the part of the manufacturers and dealers. Most of this business must be crossed off the books. The automobile trade will be held more strictly to account in the future.

The miscellaneous demand for machinery is not letting up. Orders received during the fortnight represent a wide variety of buyers' product.

The strike of molders and coremakers at Hartford, Conn., is practically a thing of the past. While technically the strike is still in progress, the places of the strikers have practically all been filled, the estimate being that a total of 20 vacancies only now remains.

The Henry & Wright Mfg. Company, Hartford, Conn., is putting on the market a new sensitive drilling machine known as the wide range type. The No. 1 and No. 6 machines are the beginning of a full line, an important characteristic of which is the ample proportions, which permit of the employment of drills up to 1 1/4 in. for commercial work. The machines contain a number of improvements over the company's existing types.

As was anticipated, the United Shoe Machinery Company has brought suit against Thomas G. Plant and the Thomas G. Plant Company, Jamaica Plain, Mass., alleging infringement of patents on shoe machinery. The three mechanisms in question are employed in the machines of the Wonder Shoe Machinery Company, recently organized, and which proposes to put on the market a full line of shoe machinery.

The One-Lock Reamer Company, New Haven, Conn., the successor of the Wm. J. Smith Company of that city, is removing its works to the fourth story of the new six-story Smedley Building on Brewery street, where additional floor space will be available as well as improved manufacturing conditions.

The original unit of the new factory of the Bosch Magneto Company, Brightwood, Springfield, Mass., will consist of a four-story reinforced concrete building, 55 x 314 ft., with ells respectively 65 x 70 ft. and 22 x 59 ft. The company is now protesting against the presence in the neighborhood of a rendering plant, contending that a nuisance exists, which must be removed or the work of building will not proceed, but some other site chosen.

The contract has been awarded for the new building of the Hart & Hegeman Mfg. Company, Hartford, Conn., manufacturer of electric specialties. The plans call for a brick and reinforced concrete structure 60 x 200 ft., four stories.

Additions to general manufacturing plants include the following: Fiske Rubber Company, Chicopee Falls, Mass., building 36 x 185 ft., four stories, addition to engine room 18 ft. square, and addition to boiler house 12 x 42 ft.; United States Paper Bottle Company, Hartford, Conn., new plant on Windsor street, but no contracts for equipment ready to give out at present; Stony Brook Paper Company, South Hadley, Mass., addition 35 x 90 ft., one story and basement; Wyandotte Worsted Company, Waterville, Maine, one-story addition 56 x 88 ft. and two-story addition 30 x 140 ft.; Morton E. Converse & Son, Winchendon, Mass., toy manufacturers, addition 75 x 150 ft.; Housatonic Power Company, Greenwich, Conn., substation 36 x 100 ft., one and two stories; Crompton & Knowles Loom Works, Providence, R. I., textile machinery, two-story addition to shops; U. S. Gutta Percha Paint Company, Providence, R. I., addition to factory; American Silk Spinning Company, Providence, R. I., large addition to mill.

The Wm. P. Kirk Company, Bridgeport, Conn., manufac-

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turer of metal cornices, skylights, &c., and heating and sanitary engineer, has increased its capital stock from \$20,000 to \$50,000, to secure additional resources for the business. The company states that it will not be in the market for equipment at this time.

The C. I. Yale Mfg. Company, Yalesville, Conn., manufacturer of carpenters' edge tools, will make large additions to its factory, owing to the inability to fill orders as promptly with present facilities as it would desire. To make possible these extensions of the business the capital stock has been increased from \$150,000 to \$300,000.

The Eastern Machine Screw Company, New Haven, Conn., has just completed its new and modern factory and is ready for business. The company will manufacture machine screws, machine screw products and hardware specialties, using a new type of screw machine the design of William H. Gates, formerly of Norwich, Conn., employing the milling process. Benjamin P. Greene, the secretary and manager, and Mr. Gates, the vice-president and superintendent, are the active men in the business.

The Specialty Mfg. Company, Melrose, Mass., manufacturer of chair and couch beds, will locate its entire manufacturing business at Mystic, Conn., within the next few months. A factory will be erected 40 x 200 ft., two stories, together with power house and dry kilns. Heating and sprinkler systems will be installed. Eli Gledhill, treasurer and manager of the Mystic Mfg. Company, is the president of the company, and the change in location is due to his influence.

The Naugatuck Mfg. Company, Naugatuck, Conn., manufacturer of seamless copper floats, is erecting an addition to its factory, which will be chiefly for the copper depositing department. Additional manufacturing space has been made necessary by the increased demand for the company's product.

The E. I. Du Pont de Nemours Powder Company states that there is no truth in the report that the branch at Valley Falls, N. Y., will be removed to Hazardville, Conn. On the contrary, the Valley Falls plant is being rebuilt. The company has established a system of bonuses in all of its plants, ranging from 2 per cent. for men who have been employed one year to 20 per cent. for those of 15 years standing or longer, the purpose being to make employment as permanent as possible.

Pittsburgh

PITTSBURGH, PA., August 2, 1910.

Indications of a renewed buying movement, such as have been manifested recently in certain quarters, are becoming more general. Within the past week many of the principal salesmen employed by leading manufacturers of the district have left for various parts of the country to close pending contracts, and, as the vacation season draws to a close, not a few negotiations that have been dragging along, because of the absence of some official connected with the buyer's establishment, will undoubtedly be concluded.

Meanwhile operations at nearly all plants of the metal working industries are still very heavy for this season of the year, and some concerns are not looking for new business beyond what comes to them in the daily mails.

The foundry of the Buckeye Steel Castings Company, Columbus, Ohio, is principally occupied at present with railroad work. The company has been making a specialty for some time past of cast steel coupler yokes, in which the defects inherent in wrought iron yokes are stated to have been overcome.

The Rogers Bros. Bridge Company, Albion, Pa., has been awarded the contract for the large new bridge to be built at Oil City, Pa. Except for reinforcing steel will not enter into the structure, which is to be of concrete.

A new machine shop is being erected in Columbus, Ohio, by W. H. Miller of that place. Further particulars are lacking.

The Erie City Iron Works, Erie, Pa., has been awarded the contract for supplying the battery of boilers to be used in the new municipal water works station, at Clarksburg, W. Va.

The factory of the Anderson Electric Porcelain Company, at East Liverpool, Ohio, which was destroyed by fire last week, will be rebuilt for larger capacity. New kilns, with a gas plant for firing, will be needed.

The Pittsburgh Smelting & Refining Company, whose plant is at Greensburg, Pa., notes much more of a tendency on the part of manufacturers, foundrymen, &c., than in former years, to save and dispose of their metal refuse. The proper utilization of this material frequently represents the difference between a good profit and a very close one, or sometimes between a profit and a loss. As a result of the systematic conservation of such waste, a good many private chemical laboratories have been established in manufacturing plants of this district, which had not hitherto

considered them necessary, and tests adequately conducted have shown numerous opportunities for economy, better methods of works practice, &c., which had been unsuspected.

The Jaeger Machine Company, Columbus, Ohio, has just let the contracts for erecting a two-story shop.

All of the railroad companies whose lines center here are finding it difficult to obtain enough skilled operatives for their shops, as industrial plants in the same towns, or at neighboring centers of manufacturing, offer better inducements to the men. Motive power officials are hampered in meeting this competition by the amount of red tape which any change involves.

Cincinnati

CINCINNATI, OHIO, August 2, 1910.

An optimistic feeling is entertained by the local trade. A careful canvass of the manufacturing plants, embracing all lines, shows that practically all of them are running on full time. Machine tool builders are receiving a fair run of orders and some of them report an excellent volume of inquiries. As these come from different sections of the country and from varied industries, it is to be supposed that a more healthy condition generally prevails. Orders received are of a small and medium sized variety, but those booked during July totaled enough to surprise some firms who were looking for the usual midsummer dullness.

Machine tool dealers have not fared as well as the builders on orders booked, but they are encouraged over the fall outlook, judging from the inquiries coming in. Second-hand machinery dealers are enjoying a fairly active business.

Power plant equipment and timber cutting and wood-working machinery are only moderately good sellers.

The Rahn-Carpenter Company, Cincinnati, is now turning out some of its lathes at a subsidiary plant in Knoxville, Tenn., which is run in connection with the Knoxville Foundry & Machine Company. W. H. Carpenter has severed his connection with the company, and the officers now are: John Rahn, Jr., president; Francis B. James, vice-president; Henry G. Frost, secretary, and A. J. Larmon, treasurer. The company reports its domestic business as good, while its export business is steadily increasing.

About November 1 the Baldwin Forging & Tool Company will move its shovel factory from Columbus, Ohio, to Parkersburg, W. Va. The company now employs about 225 people, but will require over 400 to operate the Parkersburg plant, the main building of which will be 150 x 800 ft., one story.

The plant of the Blymyer Iron Works Company, Cincinnati, is busily engaged on a large contract for sugar mill machinery, which was recently received from Spanish-America. The company's bell foundry is also working on full time.

The plant of the Dayton Ice Machine Company, Dayton, Ohio, has been purchased at a receiver's sale by a new company of similar name and will be started up in the manufacture of ice and refrigerating machinery. The new company is capitalized at \$50,000. Joseph Meyer is president and treasurer; William C. Hiester, vice-president, and C. N. Lupton, secretary.

The Elmwood Place Auto Top & Supply Company, Cincinnati, is a new partnership formed by Joseph P. Anderson and S. A. Lee. It will occupy a factory building, 25 x 100 ft., two stories, of brick construction, located at Carthage pike and Beech avenue. Practically all the necessary equipment has been purchased.

The Cincinnati Ball Crank Company, whose plant was destroyed by fire last week, has leased quarters at 1249 Plum street, Cincinnati, containing about 12,000 sq. ft. of floor space, and will resume manufacturing operations at an early date.

The Chess & Wymond Company, Louisville, Ky., cooper, has increased its capital stock from \$200,000 to \$1,000,000. No immediate additions to its plant are planned.

Sealed proposals will be received by the Board of Trustees of the Athens State Hospital, Athens, Ohio, until August 25, for furnishing and erecting one standpipe, two 150-hp. horizontal tubular boilers and a system of steam and water piping for the hospital. Dr. O. O. Fordyce is secretary of the board.

The American Tool Works Company, Cincinnati, reports its business for July as being better than for any month since one in 1907. Orders received are medium sized ones and come from no particular industry or section of the country, but are pretty generally distributed.

In the list of busy Cincinnati industries is the foundry of the J. A. Oberhelman Foundry Company, Harrison avenue and Buck street. Among its orders booked last week was one from a local company for a quantity of machine tool frames.

The Kern Machine Tool Company, 4657-59 Spring Grove

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avenue, Cincinnati, has increased its capital stock from \$50,000 to \$100,000, for the purpose of adding to its manufacturing facilities. Additional equipment will be installed in its shop and it is quite probable, if the demand for its drilling machinery keeps up, another building will be erected adjoining the present plant.

The Package Machine Company has been organized at Indianapolis, Ind., with \$25,000 capital stock, to manufacture veneer products. The incorporators are Charles E. Gregory, Frank B. Davenport and Joseph R. C. Marsh.

The Globe-Bosse-World Furniture Company has been incorporated at Evansville, Ind., with \$600,000 capital stock. Benjamin Bosse is president; A. F. Karges, vice-president; C. M. Frisse, secretary, and E. W. Ploeger, treasurer. The company is a consolidation of three large companies in the city, owning four plants.

The Standard Brass Foundry, Indianapolis, Ind., has been incorporated, with \$10,000 capital stock, by Herman Lifchitz, Albert Holzworth and Louis Sagalowsky.

The Universal Tire Bridge Company, Indianapolis, has been incorporated, with \$25,000 capital stock, to manufacture devices for pneumatic tires. The directors are R. E. Gregg, R. L. McQuat, W. W. Gregg and C. F. Gregg.

The Bromwell Wire Screen Company, Greensburg, Ind., will erect an addition to its plant and install 18 looms. The building will be 60 x 200 ft.

The Huntingburg Electric Light Company, Huntingburg, Ind., has been incorporated, with \$15,000 capital stock, to supply municipal and domestic lighting. The directors are Charles and August Miessner and F. G. Katterhenry.

The Dalrymple Contracting Company, Gary, Ind., has been incorporated, with \$15,000 capital stock, to do a general contracting business. The directors are P. W. Dalrymple, G. H. Manlove and B. A. Manlove.

C. W. Hooven, receiver for the Union Gas Light & Fuel Company, Anderson, Ind., states that an addition to the plant will be built before fall.

The Brazil, Ind., Factory Promoting Club has signed a contract with the American Sewer Pipe Company for the erection of an addition to the company's plant, for the manufacture of the larger sizes of pipe. The cost will be about \$100,000.

The Richmond Chandelier & Art Brass Works has been sold at receiver's sale to Richard Sedgwick for \$20,000. He was former president of the company.

Middletown, Ind., by vote, has decided to install a municipal electric light plant.

The Crane Credit Register Company has been organized at Lafayette, Ind., with \$10,000 capital stock, to manufacture credit registers. The directors are S. W. Crane, B. F. Hoffman and F. H. Crane.

Detroit

DETROIT, MICH., August 2, 1910.

The volume of business transacted by machinery manufacturers and dealers during July, including purchases made by automobile companies, appears to have been more generally satisfactory than was anticipated at the beginning of the month. For the first two weeks in August prospects are not, at this writing, quite as good as had been expected; but there is enough new business in sight to warrant the belief that the month will close strong, with a heavy run of fall buying immediately following. This might be said even without taking into account the amount of new building which is either in progress or about to be undertaken, as improvements made in existing plants, with ordinary replacements due to wear, offer a very substantial basis for future trade. Hence, all things considered, the outlook is certainly most promising.

A feature of no small importance this season, so far as local industries are concerned, has been the extraordinary growth of the brass, bronze and aluminum foundries, as well as finishing shops and factories, of Detroit and vicinity. The rapid extension of automobile building, both here and elsewhere, is constantly giving impetus to this trade, so that its possibilities seem to be limited only by the provision that can be made for increased plant facilities. For the next few months at least there will be a great deal of buying in behalf of the shops here, and announcements of important additions are likely to be made very shortly.

The very interesting statement is made in relation to a well-known Detroit product that the first distinctively American type of mechanical stoker, as well as the earliest of the side feed pattern of which there is any record, is the one brought out by the Murphy Iron Works of this city in 1878, after a lengthy period of experiments and tests. While subsequent changes and improvements have been made in its details, the essential features of the original design have been retained.

The Ford Motor Company, Detroit, is having plans drawn for a three-story factory building, 60 x 100 ft., at Walkerville, Ont.

The Knickerbocker Company, Jackson, Mich., has installed its dust collector system this year in a large number of foundries, where it can be used for a wide range of service, from tumbling barrels to sand blast.

The Russel Wheel & Foundry Company, Detroit, has been awarded the structural contract for the new eight-story building, 60 x 100 ft., to be used by Dodge Bros. of this city in the manufacture of automobile parts.

The Michigan Bridge & Pipe Company, Lansing, Mich., now numbers among its products corrugated metal culvert pipe of the so-called Watson pattern, which is made of non-corrosive American ingot iron, furnished by the American Rolling Mill Company, Middletown, Ohio. Service tests have shown that the pipe is extremely durable and that it will bear up under a very heavy load.

The Worden-Allen Company, Milwaukee, is securing a large amount of work on the Upper Peninsula, through the district engineering and sales office which it maintains at Houghton, Mich. The latter also represents the Lackawanna Bridge Company, Buffalo, N. Y., the interests composing the two companies being largely the same.

Contracts have been let by the Timken-Detroit Axle Company, Detroit, for the erection of its new one-story forge shop, 70 x 245 ft., which will be completed and fully equipped by early fall.

The Capitol Brass Works, Detroit, are reported to contemplate a material increase in their output, for another season, of the electromagnetic metal separators which they manufacture. These are used in machine shops, brass foundries, &c., where they take up but little space and can be operated on a minimum of power.

The Ellis Engine Company, Detroit, Mich., recently incorporated with a capital stock of \$150,000, advises it will occupy leased quarters for the first year and will confine its operations to assembling, but that ultimately it will install a complete equipment for manufacturing engines.

The Phenix Plating Works, Grand Rapids, Mich., has secured the building adjoining its present works recently vacated by the Michigan Tool & Stamping Works containing 2000 square ft. of floor space, and will install two nickel tanks, four polishing machines, a new motor and a new polishing dynamo.

The plant of the Van Dyke Motor Car Company, Detroit, Mich., now under course of construction, will be 60 x 600 ft., one story. Motive power generated by a 125 hp. Corliss engine will be used for operating purposes. The company will have all of its parts built by outside makers, and will only do assembling. All necessary equipment and machine tools have been contracted for.

The Bissell Carpet Sweeper Company, Grand Rapids, Mich., has under course of construction a warehouse building, 45 x 140 ft., of reinforced concrete construction which will be equipped with an automatic sprinkler system and an electric elevator. The company is also erecting an addition to its main factory, 38 x 42 ft.

Cleveland

CLEVELAND, OHIO, August 2, 1910.

Little inquiry came out for machine tools during the week and sales were confined mostly to single tool orders. During the early part of July dealers did a fair amount of business, but there was some falling off in the last two weeks. The total volume of business for the month, however, was not bad for this season of the year. While the general outlook in other lines is fairly good, present conditions in the automobile trade are not as satisfactory as they were earlier in the season. Some manufacturers appear to have reached the point where they can make cars faster than they can sell them and a reduction of the output has followed. This condition of the industry has resulted in some cancellations of orders placed in the spring for additional machinery equipment for delivery in the fall. In other cases shipments of new tools have been held up. This indicates that some of the leading automobile interests are going to act conservatively in the matter of further extensions. Others feel that there is only a temporary lull and are going ahead with plants for plant enlargements.

In some lines of machinery the demand is holding up very well. A local builder of heavy forging machinery reports a good volume of orders during July, there being considerable improvement over June, which was the only quiet month of the year. Very little of this business is coming from the railroads. In power equipment a good volume of orders has been coming from coal mining companies.

In the lake shipbuilding industry the outlook is not very encouraging. The present tonnage of bulk freighters ex-

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ceeds the demand, even with a heavy freight movement, and it is doubtful if many vessels of that class will be built during the coming season. Orders for two large freight boats for 1911 delivery have been placed, and some contracts are expected for passenger and package freight boats.

In addition to erecting a large plant at Niagara Falls and extensions at Fremont, Ohio, the National Carbon Company, Cleveland, will enlarge its plant at Fostoria, Ohio, by the erection of two buildings, plans for which will be prepared by the Osborn Engineering Company. The general contract for the company's new buildings at Fremont has been awarded to the Hunkin-Conkey Construction Company of Cleveland.

The Bettcher Mfg. Company, Cleveland, has purchased the entire equipment of the Bourne & Knowles Mfg. Company of Cleveland. The latter company will retire from business. The equipment consists of machinery, dies, &c., used in the manufacture of corrugated copper gaskets. The Bettcher Company will make a full line of these gaskets and will carry a complete stock of them on hand at all times.

The Anderson Tool Company, Anderson, Ind., has increased its capital stock from \$200,000 to \$300,000.

Plans for the new plant to be erected by the Ohio Blower Company, Cleveland, have been prepared by the Cleveland Engineering Company and bids will be received this week. The new plant will be of steel construction, 80 x 130 ft. and two stories.

The Aetna Foundry & Machine Company, Warren, Ohio, is making additions to its plant which will about double its present capacity. The machine shop and foundry are being enlarged and a new cupola will be added to the latter. The pattern building has been reconstructed into a forge shop and a new three-story brick building has been built for a pattern shop. Some new machinery has been added.

The Macomber Bros. Company, Toledo, Ohio, will erect a power building in that city to accommodate small manufacturers. A three-story concrete building, 210 x 230 ft., will be erected, containing a power plant, it being the intention to add additional units to the building later. The building will be located at West Woodruff avenue, North Twelfth street and Woodruff avenue. Work will be started in the fall.

The County Building Commission, Cleveland, has rejected all bids for the erection of a power plant in connection with the Cuyahoga County Court House, claiming that they are too high. A committee of the commission will confer with the engineers in regard to changing the plans somewhat, with the view of reducing the cost of the plant.

The Board of Trustees of the Athens State Hospital, Athens, Ohio, will receive bids August 25 for a standpipe, two 150-hp. horizontal tubular boilers and a system of piping for improving the water supply system at that institution. Plans and specifications are on file at the office of the superintendent of the hospital and at the offices of the engineers, the Osborn Engineering Company, Cleveland, Ohio.

The contract for the new plant to be erected by the Republic Rubber Company, Youngstown, Ohio, has been let to the Forest City Steel & Iron Company, Cleveland. The building will be of steel construction, 80 x 200 ft. and six stories.

The Canton Art Metal Company, Canton, Ohio, has received a contract for over \$100,000 worth of metal furniture, which will be used for equipping the California State Hall of Records, Los Angeles, Cal. The contract includes tables, chairs, filing cases, desks, &c.

The property on Columbus street, Cleveland, recently occupied by the McMyler Mfg. Company has been leased by the C. O. Bartlett & Snow Company, maker of elevating and conveying machinery, &c. The plant contains 76,000 sq. ft. of floor space and has complete power equipment.

The Nute Foundry Company, Cuyahoga Falls, Ohio, is enlarging its plant by the erection of a brick addition 20 x 90 ft.

The Hydraulic Pressed Steel Company, Cleveland, has increased its capital stock from \$150,000 to \$250,000.

The Peerless Brass Mfg. Company, Cleveland, has been incorporated, with a capital stock of \$20,000, by John F. Jedlicka.

Baltimore

BALTIMORE, Md., August 2, 1910.

Trade generally has been somewhat quieter during the month, although merchants and manufacturers in some lines report a very satisfactory volume of business, made up particularly of small orders and exceeding in the aggregate that taken in June. Machine tool lines continue a trifle quiet, as is customary at this season. A scattered demand is reported from the South, but the railroads continue unimportant buyers. Power equipment has been in somewhat better demand, particularly that class used in connection with

heating, ventilating and lighting, for which several very good orders have recently been placed. The demand for small shop supplies is a shade better, but the market is spotty. Contractors' equipment continues to be pretty freely taken. There is still a considerable amount of municipal work before the trade. Bridge work, in connection with general highway improvements, a high pressure pumping station and smaller power house and general equipment is being inquired for. Fabricated steel workers report a fair inquiry for smaller buildings and bridge work. Several of the larger propositions which have been under negotiation recently have been temporarily held up. A considerable amount of work in the nature of subcontracts for various classes of work in connection with the larger building operations is beginning to come out and will probably develop into orders in the near future. The bulk of the new work placed is of the smaller class, but industrial establishments generally have order books pretty well filled, with enough work to keep them quite active during the next few months. No particular betterment in the machine tool lines is anticipated by merchants and manufacturers during the heated term. The general opinion prevails, however, that a decided betterment will be noted during the early fall months.

The Baltimore Copper, Smelting & Rolling Company has plans under consideration for extensions and improvements to its plant, which when completed will increase the capacity about 25 per cent.

The Gwynnbrook Distillery Company, Gwynnbrook, will erect a seven-story bonded warehouse structure, 85 x 130 ft. The building will be of brick construction and fireproof throughout.

The award of contracts for the Hochschild-Kohn and the Brager department store additions have been held up, and it is likely that new bids will be asked for.

The construction of a sugar refinery in the immediate vicinity of Baltimore is again being seriously discussed. The project is being looked after by the executive committee of the Merchants & Travelers' Association.

The Western Maryland Railroad is considering the erection of a new grain elevator at Port Covington, South Baltimore. R. H. Pratt is the company's engineer.

The International Harvester Company proposes to erect a new warehouse on Dickson, near Mosher, street. The building will be 115 x 120 ft. on the ground plan, five stories. W. G. Uffendel is the architect.

The Chesapeake Iron Company has taken an order for building work for the F. S. Royster Chemical Company, Seawall, Md., but the bulk of the business closed recently has been of the smaller class. The plant is extremely busy on work already in hand, and is figuring on a large list of moderate size building work.

Plans are under consideration for the erection of a large power house at Frederick or Hagerstown, Md., to furnish current for the trolley lines of Frederick & Washington counties, Maryland. P. O. Keilholtz, electrical engineer, Baltimore, Md., has been commissioned, it is stated, to prepare plans for such a plant, to operate which a separate company would be formed, which would furnish the power to the several railways interested at an equal cost.

The United States Fidelity & Guaranty Company has received bids for the construction of a brick, stone and terra cotta addition, seven stories, 65 x 78 ft. on the ground plan, to be erected at Calvert & German streets. The Engineering & Contracting Company is the lowest bidder.

The C. M. Kemp Mfg. Company is busier than ever, principally on gas appliances. This concern has recently increased its facilities by the addition of various classes of equipment, and is now operating at full capacity in all departments.

The Dietrich & Harvey Machine Company continues actively engaged, although the usual midsummer season, as well as the vacation period, interfere with the closing of pending business. A waiting market characterizes the general situation. Orders during the month have been somewhat scattered, although a sufficient volume of business is on the books to keep the plant comparatively busy well over the second half of the year.

Announcement of a trustees and receivers' sale of the entire plant of the Canton Iron & Steel Company, bankrupt, together with a large quantity of bar and scrap iron at public auction at the plant in Canton, Baltimore Co., on August 17, at noon, has been made. The concern is an underlying company of the Iron & Steel Products Company of New Jersey, which also recently went into receivers' hands.

Among some of the smaller building propositions being figured on by contractors and makers of fabricated material are the following: New building for the Baltimore School for the Blind; Georgia Life Insurance Company Building, Macon, Ga., and an addition for the C. C. Willard Estate, Washington, D. C. The contract for a new building, requiring several hundred tons of structural work for the Petersburg Benevolent Mechanics' Association, Petersburg, Va., has

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been awarded to J. W. Davis, general contractor, Newport News, Va.

The Baltimore Bridge Company has recently booked orders for several large transmission towers to be erected near Baltimore, to be used for carrying the cables of the McCall's Ferry Power Company over the Baltimore & Ohio Railroad. This company has also booked orders for a quantity of sheet steel piling and four cylinders for pier construction on the Barbilla River Bridge, Costa Rica. Work on the Fidelity Building addition, under erection, is now 75 per cent. complete, while a number of smaller propositions have been completed.

The T. C. Basher Company has just closed a contract to install the heating and power system for the Catholic University of America at Washington, D. C. Water tube boilers and a Skinner Automatic high speed engine, direct connected, with a 275-kw. generator, the order for which has not yet been placed, will be installed. Trade generally has been better during July than the previous month. The boiler and tank department has been particularly busy, orders being recently booked for 20 large tanks for customers in different parts of the South.

The Bartlett & Hayward Company is busy in all departments, although usual summer dullness, as far as new business is concerned, is to be noted, and current orders are generally small. Several additions have been recently made to the machine tool equipment of this concern, and inquiries for some further equipment are being tentatively made.

The Crook-Kries Company is now established in its new quarters at Saratoga street and Park avenue. The company has just received the contract for the power plant and heating apparatus for the new building of the Fidelity & Deposit Company of Maryland. Three Edgemoor water tube boilers of 250 hp. each and for 100 hp. Ball engine will be installed. This concern also has the contract for the heating and boiler plant for the Southern Office Building, Washington, D. C., as well as that for a central heating plant for the Hannamore Academy at Reisterstown, Md. A very satisfactory volume of small work has also been recently contracted for.

The Aumen Machinery & Supply Company, 324 N. Holliday street, went into the hands of a receiver on June 26. William J. O'Brien, Jr., was appointed receiver by Judge Niles in Circuit Court No. 2. The appointment followed the filing of a bill of complaint by M. L. Coale and W. J. O'Brien, Jr., trustees of the estate of Joseph M. Coale, holding a large block of the company's stock. The company made no objection to the receivership, under which it expects to pay its indebtedness in full. It is a Maryland corporation, with a capital of \$50,000.

The Board of Awards, Baltimore City, will take bids until August 17 for furnishing materials and erecting complete a power house, also bids for furnishing and installing engines, generators, switchboard and wiring; for boilers and piping in power house and in grounds, and for a water supply, including storage tank and pumps, for the Bayview Asylum, under the direction of the Board of City Charities. Drawings and specifications may be seen at the office of the Inspector of Building, City Hall, after August 2, 1910. The Board of Awards will also receive bids until August 10 for the construction of the sub and superstructure of the Poplar Grove Street Bridge, from specifications on file at the office of the Commissioners for Opening Streets, City Hall. Bids will also be opened on August 17 for the construction of a steel and concrete bridge over Jones Falls, at Pratt street. Plans and specifications may be obtained from O. F. Lackey, harbor engineer, City Hall, Baltimore, Md.

St. Louis

ST. LOUIS, August 1, 1910.

A favorable factor in St. Louis and in the east side cities comprised in this manufacturing district is that skilled mechanics are well employed and at present there is no labor agitation. Except with companies exclusively in heavy and light railroad supplies, new business is being secured each week, and, even in case of this line, most of the local companies are busy on prior contracts. There is a good demand for merchant steel bars, but for only moderate merchant pipe. The leading manufacturer of Babbitt metals states that business for July was 33 per cent. better than the corresponding month of 1909, and for the first half this year a gain of 27 per cent. over the same period last year.

The Kewanee Siphon Pump Company of Kewanee, Ill., has been incorporated. Capital stock \$2,500. Incorporators, F. L. Thelen, John L. Skeffington and F. M. Grimes.

The Green's Car Wheel Mfg. Company, which makes a specialty of gray iron machinery castings, states that at present the demand is not as large as it was before the summer season.

The Williams Patent Crusher & Pulverizer Company re-

port a good inquiry for its machine, of which over 1500 are now in use. At present the best call is coming from the manufacturers of alfalfa feed.

The Coyle Mfg. Company, while having some business in millwright work, is quite busy in turning out its ash and coal elevators. Among other recent contracts for the same are the St. Louis Brewing Association's Wainwright branch and two for the Board of Education for public school buildings.

The Westinghouse Air Brake Company finds at present only a moderate demand coming from this district, there being some steam and traction promotion operations which are postponed until fall.

Hall & Brown Woodworking Machine Company states that it finds some improvement in the demand during the past fortnight, particularly for its heavy fast feed Mississippi planers and matchers, new model numbers 66 and 36, orders for seven machines being received during the past week. It regards the outlook for fall business as favorable.

The Adrean Mfg. Company, which makes a specialty of railway supplies, states that owing to the increase in heavy railroad equipment there is an excellent demand for track tie plates and rail joints.

The Brownell Company finds a fair demand in the section handled by its St. Louis office for both engines and boilers starting up after a few weeks which ruled quiet.

The Reliance Machine & Tool Works is finding an excellent demand for its Reliance hoisting machine coming from the Central West and Southwest, together with a fair inquiry for its Hooker patent pump.

The Stupp Brothers Bridge & Iron Company states it is nearly snowed under by virtue of experiencing a continued demand for highway and railroad bridge work on top of contracts already in hand. Among other structural jobs is about 300 tons structural material for the new addition to the Commonwealth Steel Company's plant.

The Otis Elevator Company is full of business for elevators, partly local, for warehouses, mercantile and other buildings, together with contracts at Kansas City for office buildings, &c.

The J. A. Fay & Egan Company, beside partial equipment for planing mills in the Southwest, has just made its fourth sale in St. Louis of its large 60-in. band resaw machine.

The Scott-Madden Iron Works Company finds a fair demand, which, with contracts on its books, is keeping its two factories running full in turning out brick presses, auger machines, mud machines, dry pans, pulverizers, crushers, elevators, &c.

The St. Louis Lightning Rod Company, the largest factory in this line in the country, states that its business is quite subject to weather and crop conditions, as its trade lies largely in agricultural sections. While these factors recently were unfavorable, of late there has been an improvement and orders are correspondingly more plentiful.

The Victor Automobile Mfg. Company, St. Louis, Mo., will commence in the near future the construction of an automobile factory which is to be completed by January 1. The new building will be of fireproof construction and will double the company's present capacity.

Sealed bids will be received at the office of the city clerk, Slater, Mo., until August 9, for furnishing material and labor and extending a system of water works and electric lighting. Separate bids will be received as follows: For furnishing labor and material for extending water works and electric lighting systems; for furnishing material and labor and constructing concrete reservoir; for furnishing switchboard, generators and transformers; for furnishing two high speed engines for 60 and 100 kw. generators; for furnishing boiler and feed pumps; for furnishing material and erecting chimney, all f.o.b. cars, Slater, Mo.

The South

NASHVILLE, TENN., August 1, 1910.

In the more northerly districts of the South there is not much buying of any kind being done at present, whether of machinery, material or supplies. Few salesmen are out, and those that have been trying to drum up trade lately seem to experience considerable difficulty in getting any one even mildly interested. In perhaps the majority of instances the individual responsible for ordering cannot be found, unless the transaction is one that has been left in the hands of a subordinate. Manufacturers have largely gone to the mountains or seashore with their families, to remain until the dog days are over.

At the Chattanooga works of the United States Cast Iron Pipe & Foundry Company preparations are being made for what probably be the most active fall trade in their history. It is anticipated locally that within the next year

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or two the works will be largely increased to correspond with their growing importance in the company's business. There are few, if any, cities of the country where the operating conditions are better.

The new steel bridge across the Loxahatchee River at Jupiter, Fla., will be built by the Champion Bridge Company, Wilmington, Ohio.

It is reported from Atlanta, Ga., that the Southern Fixture & Cabinet Company, concerning which no further particulars are given, will build a large manufacturing plant there, electrically operated.

The Southern Motor Works, Jackson, Tenn., has completed the removal of its plant to Nashville, where it has been merged in that of the Southern Automobile Company, whose organization was recently reported.

The contract for the new steel standpipe of 500,000-gal. capacity to be erected in connection with the extended water works system at Montgomery, Ala., has been let to the Hartley Boiler Works Company of that city, which is now doing a good deal of work of this kind for municipalities, railroads and industrial plants. Elevated steel tanks are in greater demand this year than they have ever been.

The Tampa Electric Company, Tampa, Fla., which operates an engine driven and steam turbine plant of about 6500 kw., will install some auxiliary equipment, including a motor generator set of 750 to 1000 kw. capacity. The machinery contracts have been practically closed.

The Southern Mfg. Company, Columbus, Miss., is just placing in service the plant formerly occupied by the New South Plow Works, which has been idle for some time past, pending a change in ownership and the effecting of needed improvements, alterations, etc. It is now in good operating condition.

The capital stock of the Wheeling Mold & Foundry Company, Wheeling, W. Va., has been increased from \$405,000 to \$500,000. No plant additions of any consequence are contemplated at this time.

The Holt Engine Company, Burlington, N. C., is buying a line of machines to include lathes, milling machines, foundry equipment, for the manufacture of rotary engines. The company was recently organized to manufacture a new type of engine, to include the Holt rotary engine and the Holt rotary compound engine, which is automatically changeable to high pressure on both rotors. No boilers or engines will be needed, as all of the equipment will be motor driven. The officers of the company are as follows: John M. Cook, president; Lafayette Holt, first vice-president; George F. Hunt, second vice-president; W. W. Brown, treasurer, and John R. Hoffman, secretary.

Specifications will be ready within the next 30 days for water works system and electric light plant to be built at Dalton, Ga., by the H. S. Jaudon Engineering Company, Savannah, Ga. The water works system will include a pumping plant to produce 4,500,000 gal. daily, and the specifications will call for a steam pump and electric pump, filter tank, &c. The electrical equipment will include compound condensing engines direct connected to generators, and a plant of about 500 hp. will be installed.

The Southwest

KANSAS CITY, MO., August 1, 1910.

Salesmen of machinery houses who have been through different sections of the Southwest recently have very little success to report so far as the closing of contracts is concerned. Trade in most lines is slow everywhere, with practically no indication that it will pick up much before September. Only municipal buying continues active. Contractors, whose machinery requirements extended over a much longer period than usual this season, now appear to have about all the equipment that is needed for the present. Foundries and machine shops are busy both with orders and plans for fall enlargements, but their owners are not ordinarily ready to discuss equipment details, believing that they will have no difficulty in securing deliveries as needed later on. For immediate use second-hand tools sell to rather better advantage than new, particularly inferior stock, which can be offered at very low prices. This, however, is taken principally for repair work in logging districts, construction camps, mining fields, &c. Light apparatus is given preference for this service. Second-hand power machinery, including engines, small dynamos and motors, can also be placed more readily just now than new, except when purchased by cities or electric traction companies, which show an increasing tendency to install only the best modern equipment.

The Freeborn Engineering & Construction Company, Kansas City, has taken the contract for a new cement manufacturing plant to be built near Chamberlain, S. D., by the Dakota Portland Cement Company, whose headquarters are in Sioux Falls, S. D.

An electric power plant will be installed in the basement of the new seven-story factory building to be erected in Kansas City by the National Biscuit Company of New York. Motors will be used throughout.

The J. Faessler Mfg. Company, Moberly, Mo., has built up a large trade in special tools for boiler and tank making. A good many orders within the past few months have come from locomotive works and railroad repair shops.

A new wood working plant will be built in Terrell, Texas, by the O. F. Walton Company.

H. C. Darnell & Co., whose offices are in the new Nelson Building, Kansas City, represent the Insley Mfg. Company, Indianapolis, Ind., in the sale of the latter's automatic roller hoist, steel buckets, &c., which have been very extensively introduced through this section during the present season.

Two motor generator sets of 200 kw. each will be installed by the Arkansas Valley Interurban Railway, Wichita, Kan., in substations to be constructed along its line. The company does not operate an electric generating plant, power being purchased from a local central station.

The electric generating machinery installed in the municipal power and pumping plant at McPherson, Kan., was destroyed by fire last week. New equipment is reported to have been already ordered.

The Antlers Light & Power Company, Antlers, Okla., recently incorporated with \$10,000 capital stock, advises it will be in the market in the near future for two boilers of 80 or 85 hp. and engines, and later on for a cotton gin and ice plant.

The plant of the Amarillo Ice & Cold Storage Company, Amarillo, Texas, was recently destroyed by fire at a loss of about \$100,000. While it has not been definitely decided, the plant will probably be rebuilt.

The United States Iron & Steel Company, Houston, Texas, has been incorporated with capital stock of \$150,000 by N. L. Mills, J. W. Barnes and J. B. Hine.

The Otto Weiss Alfalfa Stock Food Company, Wichita, Kan., advises that it will rebuild its plant, which was destroyed by fire last April, but will not be in the market for any equipment, as the power plant was saved, with the main shaft, pulleys and connections. All other necessary machinery has already been purchased.

The city of Foss, Okla., has prepared plans and specifications for a water works system to be constructed at a cost of \$25,000.

The Missouri Pacific Railroad Company has taken out a permit in Kansas City, Mo., for the construction of a machine and repair shop to cost \$136,000. It will be 153 x 224 ft., and is to be ready for occupancy by May 1, 1911.

Citizens of Yukon, Okla., have voted a \$30,000 bond issue to help defray the cost of erecting a water works and sewer system. The water works system will cost about \$30,000 and \$10,000 is to be spent on the sewerage system.

Milwaukee

MILWAUKEE, WIS., August 1, 1910.

With the beginning of the last month of summer it is clear that conditions not only throughout this country but also in the world at large, as they are to be observed through the eyes of the manufacturers and dealers of Wisconsin, have recently been shaping themselves along the lines of a very heavy fall trade. Inquiries have never been more plentiful, and the extent to which estimates are called for indicate that a multitude of new projects or improvements is being planned. Those who are conversant with the outlook here have exceptional opportunities for judging the situation everywhere. Wisconsin has attained especial prominence in the machinery field as a producer of equipment for the generation and utilization of mechanical, electric and pneumatic power of every description, and as some form of such equipment is included in practically every scheme for industrial growth or betterment, the impending activity can be very accurately gauged from that standpoint alone. Further evidence, however, of the facts above stated is obtainable in the business and information of numerous plants in this State that are engaged in the production of other apparatus which enters into practically every industry. All are preparing for a degree of future activity that will transcend anything heretofore known.

Another feature of much importance is also to be found in a gradual rise of values for standard machinery. The cut-throat competition that was so generally prevalent a year ago has been practically eliminated. In many cases this condition is accompanied by a further increase in the margin of profit, as a result of closer business management, better shop methods and the use of improved machinery, so that the net result is extremely gratifying to the more progressive manufacturers.

Current business in shop and foundry equipment, includ-

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ing machine tools, is good for this time of the year. Manufacturers are not making any very strenuous campaign for orders, having already enough on their books to carry them along for quite a period. Dealers also seem to be more concerned in looking out for the requirements of their regular customers, which are being filled as fast as the necessary shop room is provided, than in going after new trade. With all of the shops recently completed or under construction, as well as changes made in established plants, the quantity of equipment installed by autumn will break any previous records. The season has, in fact, come to be one of superlatives.

Owing to the large demand for its product which has already developed, the Badger Four Wheel Drive Auto Company, Clintonville, Wis., recently decided to begin the manufacture of motor vehicles without waiting for the erection of a new factory, and a local machine shop has been leased for the purpose. Building plans will be carried out later. This company is likely to require considerable equipment as the business grows.

Bids are now being taken on a large steam generating and distributing plant for the new factory of the Racine-Kelley Rubber Company, Racine, Wis., the principal details of which have previously been reported.

Travelers for houses that manufacture agricultural machinery, such as the J. I. Case Company, Belle City Mfg. Company, S. Freeman & Sons Mfg. Company, Racine; La Crosse Plow Company, La Crosse; Anderson Mfg. Company, Eau Claire; Fond du Lac Implement Company, Fond du Lac; J. Thompson & Sons Mfg. Company, Beloit; Janesville Machine Company, Janesville; J. S. Rowell Mfg. Company, Beaver Dam; Baker Mfg. Company, Evansville; Hartford Plow Works, Hartford; Van Brunt Mfg. Company, Horicon; A. B. Stevens Company, Marinette; Fuller & Johnson Mfg. Company, Madison, and other representatives of Wisconsin concerns, who were recently questioned by a dealer having large interests in the southern part of the State, are unanimous in reporting that better care of agricultural equipment of all kinds is being taken than in former years. It is not so generally allowed to stand out exposed to the elements, where it will rust, and when repairs are necessary they are more promptly attended to, so that an actual breakdown less frequently occurs. For this condition, which will affect manufacturers—and through them the machine tool builders—more and more as the years go by, the influence of the agricultural course at the University of Wisconsin, Madison, with its extensive lectures, summer school, &c., appears to be mainly responsible. It is favorable to the better grades of machinery, for the reason that deterioration due to wear alone can be more quickly determined when apparatus is otherwise properly cared for, and will mean the gradual elimination of equipment that is meant to last only for a couple of seasons. Some profitable repair work may also be cut out, but the general effect will be decidedly beneficial to responsible manufacturers of the order of those above mentioned. The university ought also to have its need of credit.

Plans have been completed for the two-story plant, 40 x 100 ft., to be built by the Racine Tool & Machine Company, Racine, Wis. A gas producer, gas engine, dynamo and motors will be used to furnish power, and all equipment purchased for the shop will be of correspondingly modern design. The construction of the building will include cast iron columns, steel girders and floor beams, brick walls and composition roofing.

The Sheboygan Light, Power & Railway Company has awarded contracts for the improvements recently mentioned as contemplated, including a steam turbine, generating unit and auxiliary machinery. This will be installed in the power house at Sheboygan, Wis.

Construction is about to begin of the new plant of the C. B. Henschel Mfg. Company, Milwaukee, the foundations of which have been completed.

A power house building will be erected shortly in connection with the new manufacturing plant of the Sternberg Mfg. Company, West Allis, Wis. The machinery has been ordered.

So much has been said about the economies in other directions made necessary by the rise of the automobile industry that it is of interest to note what its effect has been upon the carriage and wagon trade of this State. Light driving vehicles used purely for convenience or pleasure have, of course, given way largely to motor cars; but, despite the rapidly increasing use of automobile trucks, the demand for carts and wagons has more than kept pace with it. Every wagon maker in the State, including such representative concerns as the F. Mackinnon Mfg. Company, Grand Rapids; Bain Wagon Company, Kenosha; Fish Brothers Wagon Company, Racine; Mandt Wagon Company, Stoughton; Racine-Sattley Company, Racine; Vaughn Mfg. Company, Jefferson; Randolph Wagon Works, Randolph, and others whose plans for new shop buildings, substitution of electric for belt drive, &c., have been heretofore mentioned, has been

increasing its output. Some of these are also going into the motor truck business, but not at the expense of their standard lines, except in an occasional rare instance. Contractors' carts have been in especially heavy demand this season, and the tendency toward steel or semi-steel construction is widening the market for those materials. In farmers' wagons, also, the use of metal parts is gaining.

Allis-Chalmers Company reports the sale of considerable rock crushing machinery in the far West. On the Pacific Coast an order recently taken for the account of the Acton Rock Company, Los Angeles, Cal., includes one No. 12, two No. 5 and one No. 2 style K Gates breakers, two large revolving screens, conveying apparatus and a line of induction motors varying from 3 hp. to 175 hp. The user of this machinery is preparing to furnish large quantities of commercial stone.

The Bedford Power Company, Bedford, Ind., which is planning a very extensive hydroelectric development on the east branch of the White River at Williams, Ind., has ordered two 750-kw. steam turbine generating units here with which to start its power delivery. After the installation of hydraulic turbines and generators, these machines will serve as steam auxiliaries for emergency use. The manufacturer, Allis-Chalmers Company, has also been awarded the contract for the first of the hydroelectric units. These include two triplex vertical turbines of 1050 hp. each, operating under the low commercial head of 17 ft. They will be direct coupled to 1000 k.v.a. (at 70 per cent. power factor), 2300-volt, 60-cycle, three-phase alternating current generators. Later on three larger units will be put in service.

Installation of machinery is being completed at the plant of the Anson-Gilkey-Hurd Company, Merrill, Wis., which will be one of the largest woodworking factories in the Northwest.

Although no official announcement has been made on the subject, it is generally accepted in machinery circles here as a fact that the works of the Fred Prescott Steam Pump Company have been sold to the International Steam Pump Company, New York, and that Fred Prescott will remain in charge for the present. This is a very desirable property and will be taken over in excellent operating condition. The company began last month with a large amount of work on its books and the shops crowded to capacity.

The Brodesser Motor Truck Company, Milwaukee, Wis., will erect upon a site recently acquired in Janesville, Wis., a factory building, 60 x 200 ft., a power house and a warehouse.

The Northwest

ST. PAUL, MINN., August 1, 1910.

Along the international boundary line, from Grand Marais to Vancouver, B. C., there is now in progress a great deal of development work, including systematic exploitation of mineral and timber resources, water powers, &c., which has gone far toward strengthening the market for machinery and fabricated material of every description. From the western provinces of Canada this market, in common with others of the Northwest, is deriving a larger share of its trade than ever before, and local representatives of Eastern houses are particularly energetic in reaching out for such portions of this business as are not directly covered by Canadian agencies. In doing so they have been assisted not a little by the tremendous volume of travel this summer through St. Paul and Minneapolis of people residing on the other side of the border, among whom are many machinery users. A large number of the latter have stopped here to inspect equipment and leave orders. If it were not for tariff restrictions the amount of business thus transacted would, of course, be much greater.

The contract for an immense concentrating plant to be erected in Arizona by the Chino Copper Company, which has been designed for a capacity of 3000 tons daily, has been let to the Minneapolis Steel & Machinery Company, Minneapolis. It will be built in three sections of 1000 tons capacity each. The machinery will all be operated by means of electric motors. A power plant of 3000 kw. is now in course of construction.

One of the best equipped steam turbine plants in the Northwest has been put in service by the Virginia & Rainy Lake Company, at Virginia, Minn., and its operation is being very closely watched by other industrial companies on the ranges. The main units were built in the West Allis, Wis., shops of Allis-Chalmers Company.

The contract for equipping an electric power plant to be used in municipal service at Aurora, Minn., has been let to the Marshall-Wells Hardware Company, Duluth, Minn., which is making arrangements for the necessary machinery.

The Malleable Casting Mfg. Company, whose foundry is in North St. Paul, has practically had its pick this season of

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business offering, owing to the quantity that can readily be secured by plants whose work is recognized as reliable. An increase in the company's facilities will be gradually brought about without disturbing the operation of the foundry.

Changes are to be made at once in the Grand Forks, N. D., plant of the Red River Power Company, nearly doubling its present capacity.

Machinery is being installed in a new planing mill at St. Joe, Idaho, by the Milwaukee Land Company, which will be in the market later on for some additional equipment.

The city of Biwabik, Minn., on the iron range, will build an electric power and lighting station and purchase machinery by or before fall.

The Peteler Car Company, Minneapolis, which builds steel cars for mines, quarries and industrial operations of various kinds, is using chilled wheels which wear extremely well under the most severe conditions of service. This season the cars are being sold largely to contractors for railroad and other heavy construction work.

It is stated by the representative of a leading machinery building company that the action of the Washburn-Crosby Company, Minneapolis, in installing electric motors for driving machinery in its mills, with use of a steam turbine and alternator for generating the power, will be followed to a large extent in future by other Northwestern plants of a similar character.

The Central States Bridge Company, which has an office in the Northwestern Building, Minneapolis, is getting a very good share of the work in this part of the country, both under public contracts and for mill and factory buildings.

The Northwest Thresher Company, Stillwater, Minn., is increasing its shop force and preparing for a large output for the coming year. Despite unfavorable crop reports from the wheat growing districts of western Minnesota, the Dakotas and Manitoba, every indication now points to a material strengthening of the demand for agricultural machinery for another season, due to the extent of the area now under cultivation. The manufacturing plants of this section are, therefore, about to provide facilities, including shop equipment, sufficient to care for their share of the trade.

The plant of the Black Hills Brick & Mfg. Company, Sturgis, S. D., which burned last week, will probably be rebuilt and furnished with machinery for considerably greater capacity. The company's plans for the future have not yet, however, been fully determined upon.

The Herzog Iron Works, St. Paul, is adding more molds for ornamental metal work used in large buildings, the demand for this material being now very heavy.

The Disc Grader & Plow Company, which removed to Minneapolis from Hunter, N. D., and now has its general offices in the Andrus Building, is manufacturing a combination machine that has sold extensively this season to road contractors. It is probable that by another year the company will be compelled to considerably increase its plant facilities.

It is reported from Wallace, Idaho, that the plant of the Dalmatia Mining Company, which was recently consumed in a local conflagration, will be replaced at once and furnished with the best character of modern equipment. Further details are lacking.

The self-contained hoisting engine units manufactured by J. S. Mundy, Newark, N. J., are meeting with a large sale throughout the Northwestern States. The builder is represented in this territory by G. E. Ingersoll, St. Paul, who has an office in the Pioneer Press Building. He carries a line of this machinery in a local warehouse, ready for immediate shipment.

Extensive municipal improvements, including the probable purchase of more pumping machinery, are under consideration at St. Paul, Minn.

The Elk Mines Corporation, Elk City, Idaho, will install a new boiler and other equipment for its mine and concentrating plant.

Preparations are now in progress for the purchase and installation of an electric power and lighting station of about 150 kw., to be operated by the city of Bridgewater, S. D.

An effort is being made by the Commercial Club, St. Cloud, Minn., to secure new industries for that place. One of the projects now under way is the formation of a company to quarry and finish the granite of the locality, of which there are extensive beds. If this undertaking succeeds it will call for the purchase of considerable machinery.

John Morrell & Co., Sioux Falls, S. D., packers, are having erected a packing plant, consisting of ten buildings, among which will be included a boiler, engine and ice house.

C. Millers & Sons, Clermont, Iowa, have been granted a 25-year franchise by Calman, Mo., for the construction of an electric light plant at that city.

Webster Wheelock, Hackney Building, St. Paul, Minn., is having plans prepared for a power house to be used by a number of manufacturing concerns, 87 x 300 ft., seven stories and basement, to be erected at a cost of \$300,000.

The Fort Dodge Iron & Metal Company, Fort Dodge,

Iowa, is negotiating for the purchase of a plant in that city which if purchased will be remodeled into a foundry. The company advises that in case it fails in its negotiations it will erect a foundry in the course of the next 60 days.

The Farther Central West

OMAHA, NEB., August 1, 1910.

No general description can be made to characterize conditions in this part of the country at the present time. For most lines of industry there is relatively little buying of new equipment, but the situation differs with the community or district involved, and there are some very good sales being made in places where no particular activity was looked for until after the heated season. In the mountain country the progress now being made in opening up new mines or developing existing ones continues to bring out considerable business, with the assurance of heavier purchases later on. At the larger centers of population through Iowa, Nebraska, Colorado, Wyoming and Utah, there is also evidence of extensive plans for construction work of various kinds which will be completed externally before winter sets in. Comprised in this are some industrial establishments, a good many power and pumping plants and numerous large buildings for which heating apparatus, electric dynamo sets, ventilation fans, sprinkler systems and other mechanical appliances will be required. As a whole the outlook is favorable.

E. A. Bullock, president of the Norfolk Electric Light & Power Company, Norfolk, Neb., contemplates the installation of an electric generating station for power and lighting service at Bonesteel, S. D., where a franchise for the purpose has been applied for.

The Clinton Bridge & Iron Works, Clinton, Iowa, has taken the contract for a steel bridge to be built near Davenport, Iowa.

The Denver, Colo., representatives of the Jeffrey Mfg. Company, Columbus, Ohio, note an increase in the demand for conveying machinery. This is an indication that additions are to be made to many concentrating plants and smelters in the mining districts, as apparatus of that type is usually purchased in connection with other machinery, for which it forms the connecting link.

Funds for the construction of a pumping plant and water distribution system are being provided at Centralia, Iowa, where bids on machinery will be taken in about 60 days.

The Waterloo Cement Machinery Company, Waterloo, Iowa, since establishing a branch office in the Fitzsimmons Building, Pittsburgh, Pa., has been receiving a liberal volume of orders from Eastern territory, where its Polygon mixer, in consequence of the speed with which it can be operated, is being used to excellent advantage on construction contracts that were specified for completion within a limited time. For the coming spring an enlargement of the company's manufacturing plant is said to be contemplated.

The new machine shop for repair work that is to be added to the terminal facilities of the Utah Light & Railway Company, Salt Lake City, Utah, will be put in operation this fall.

The Ottumwa Bridge Company, Ottumwa, Iowa, has prepared plans covering four new steel bridges to be built for the county.

The Zophar Mining & Milling Company, Wallstreet, Colo., will hereafter be in the market at intervals for electrical equipment, having recently substituted motor drive for water power and shafting formerly used.

An air compressor plant will be installed at Central City, Colo., and other machinery provided for driving tunnels on the property of the Arundel Mines. The equipment is to be furnished by the contractor, S. A. Knowles, whose present address is given as Idaho Springs, Idaho. Mr. Knowles was in charge of the work on the famous Newhouse Tunnel.

One or more pumping units of larger capacity than the machinery now operated will be required in the near future at Logan, Iowa, where important improvements are contemplated. The complete plans are being worked out.

The Murray Iron Works Company, Burlington, Iowa, is having a very successful year in the sale of engines for power plant service. For high speeds the company has introduced a number of innovations in Corliss engine practice which enable these units, in the smaller sizes, to compete with four-valve and automatic engines for installation where this has not been practicable heretofore.

A steel viaduct nearly 900 ft. long, with electrically operated bascule bridge, or one equally well adapted to the service, will be built at Ft. Dodge, Iowa, where bids are to be taken by the authorities until the last week in August. Specifications can be obtained from the city clerk.

The Kelly Mfg. Company, Waterloo, Iowa, which is identified with the same interests that compose the Kelly Foundry & Machine Company, Goshen, Ind., has had its

THE MACHINERY MARKETS

shop facilities crowded this season to supply the demand for machinery and fabricated material of different kinds used by contractors. It is the expectation locally that the plant will be considerably enlarged.

Work has begun on the new power house for the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, which is to be 132 x 154 ft.

It is reported from Grand Junction, Colo., that a large timber cutting plant and planing mill will be established there by the Rocky Mountain Box & Lumber Company.

The Isabella Company, owner of the Empire State mine at Cripple Creek, Colo., is reported to contemplate the purchase of a new hoist.

It is reported from Sioux City, Iowa, that for the auxiliary pumping station now under consideration a deep well pump operated by a steam turbine or electric motor will be purchased. The plan has not yet, however, received final sanction from the authorities.

The Golden Cycle Mining Company, Colorado City, Colo., is installing a 30-drill air compressor furnished by the Ingersoll Rand Company, New York, and will make other improvements.

The Gunnison Valley Power Company, Gunnison, Utah, has placed an order with Allis-Chalmers Company, Dooley Building, Salt Lake City, for machinery including a 540-hp. single horizontal turbine with cast iron spiral case, operating under a head of 210 ft., direct connected to a 300 kva., 2300 volt, 60-cycle, three-phase alternating current generator, also a 10-kw. exciter and three power transformers of 100 kva. each.

The electric power and pumping plants operated by the city at Alliance, Neb., are to be enlarged and improved. The preparation of plans has been intrusted to Grant & Letton, F. & M. Building, Lincoln, Neb.

The Christie Engine Company, Waterloo, Iowa, has acquired another site of considerable extent and will erect a large new plant for the manufacture of gasoline engines.

In the new power house of the Waterloo, Cedar Falls & Northern Railroad Company, which was mentioned in *The Iron Age* last week, there will be installed four steam turbines and generators having an aggregate capacity of 24,000 kw. For serving the engine room a large traveling crane is to be provided.

Electric motors for driving machinery in its mill have been ordered by the Layton Milling & Electric Company, Layton, Utah.

Work is about to begin on the new plant to be erected in Muscatine, Iowa, by the Ritchie Corrugating Company, Ottumwa, Iowa. The main part will consist of a two-story building, 40 x 100 ft., and a one-story shop, 60 x 100 ft.

Twelve tubular boilers of 525 hp. each, built by the Babcock & Wilcox Company, New York City, are being installed in the new power plant at Omaha, Neb., of the Omaha & Council Bluffs Railway Company.

A. G. Brown, Cedar Rapids, Iowa, has arranged for the construction of a new factory building.

Machinery for the new municipal power and lighting plant at Pochontas, Iowa, will probably be purchased the latter part of this month.

One 80-ton and five 60-ton steam shovels built by the Marion Steam Shovel Company, Marion, Ohio, are being used in the construction of the great Standley Lake dam, near Denver, Colo., of the Denver Reservoir & Irrigation Company.

The plant of the Beatrice Electric Company, Beatrice, Neb., which is equipped with engines of 450 hp., built by the Murray Iron Works Company, Burlington, Iowa, will be enlarged and improved, having recently passed under the control of new interests.

The Utah Hotel, Salt Lake City, Utah, has awarded a contract to the Trent Engineering & Machinery Company of that city for the construction of an electric plant.

The North Pacific Coast

TACOMA, WASH., July 29, 1910.

Trade with Alaska and the Northwest provinces of Canada is now one of the leading features of the market in machinery and supplies. Heavy shipments to points as far as Nome and Dawson have been started from the principal ports on the sound and river, and as the open season at the north set in very much later than usual this year, the movement will probably continue longer. The success attending dredging operations along the Yukon and its tributaries has led to the formation of quite a number of new companies for the purpose, and some of these have given their orders for machines, which are being hurried forward or have been already installed. Within the next three or four months other contracts will be placed for dredges to be delivered next spring. Each of these machines, of course, includes its own power equipment, and many are now operated by direct

motor drive for each of the separate parts, a generator being installed on the dredge to furnish current for that purpose.

As an indication of the character of the machinery now going into Alaska, it will probably surprise some manufacturers in the East to learn that Nome, which is almost within the Arctic Circle, has a steam turbine generating station of 500-kw. capacity, which furnishes electric lighting for the community. This plant, which was built by the Nome Mining Company and has not been long in operation, is already to be enlarged. The boiler capacity is sufficient to permit of installing another turbine unit of the same size.

From Edmonton, Alberta, where a gas engine and generator of American build are in service at the municipal power plant, it is reported that further opportunities for the sale of similar units, to operate on natural gas, will be opened up in the near future by the development of the new fields, of large extent and great pressure, which were discovered north of Calgary not long ago. Gas producer power is also receiving considerable attention on both sides of the border.

The Washington Machinery Company, Tacoma, is representing the Syracuse Smelting Works, Brooklyn, N. Y., in the sale of bearing metals, the demand for which in this part of the country is steadily growing.

The Holmes Machinery & Saw Works, Tacoma, has kept its shop busy all through the first half of the year, with sufficient stock in the warehouse to enable prompt shipments to be made on orders. In addition to other lines it is handling electric motors, both new and second hand.

A company headed by John Bagley, president of the Pacific States Lumber Company, Tacoma, has been organized to take over and operate the shops formerly occupied by the maintenance department of the Tacoma Eastern Railroad at Bismarck, N. D. For the present a specialty will be made of repair work. The company has been incorporated as the Nisqually Iron Works, Tacoma.

Interests identified with the Western Steel Corporation are reliably reported to have purchased a large tract of coal land in British Columbia.

Work is now in progress on the new plant of the Northwestern Wheel & Wagon Works Company, Bellingham, Wash., whose plans have previously been mentioned.

The Western Brass Works, which has been organized at Tacoma by Lewis Bros., will continue the business of the latter on a much larger scale. Plans for a casting and finishing plant are now being worked out. Considerable new equipment will probably be required.

J. L. & S. A. Kendall, who have a hydro-electric plant at Roseberg, Ore., in which an alternating current generator of 200 kw. is driven by a water turbine, have ordered a heavy duty Corliss engine which will be belted to the generator in the season of low water.

The Nay-Aug Idaho Mines Company, which is reported to be now under the management of W. W. Chambréau, Portland, Ore., is building a hydro-electric power plant with which to supply power to its properties in the vicinity of Hailey, Idaho. At what is known as the Nay-Aug mine a hoist, air compressor and other machinery are now being installed.

The Cove Power Company, of which Warren Brown is secretary, has been incorporated at Prineville, Ore., and will build a hydro-electric plant of 6000 kw. or possibly larger capacity.

Bonds have been voted at Ashland, Ore., for an electric plant to be operated by the municipality, and the work of construction and equipment will be undertaken in the near future.

The Perine Machinery Company, Seattle, reports a fairly good demand at present for the better grades of second-hand and rebuilt equipment.

The Armstrong Machinery Company, Spokane, Wash., is making a specialty of refrigeration plants, the machinery for which has been selling to uncommonly good advantage this summer.

The Nickerson-McFarlane Machinery Company, Tacoma, Wash., is erecting a new machine shop, 60 x 140 ft., near its present shops at Fifteenth and Dock streets. The company also has under construction a 100-ft. wharf, which will be served with a 20-ton crane. The company will not purchase any new equipment at present, but would like to secure agencies for machine tools and equipment.

Government Purchases

WASHINGTON, D. C., August 2, 1910.

The Bureau of Supplies and Accounts, Navy Department, will open bids August 16 for one forging press, schedule 2763; two lathes and two gear cutting machines, schedule 2764, and one screw machine, schedule 2765.

William Crozier, chief of ordnance, United States Army, will open bids September 15 for furnishing electrical apparatus for operating two 14-in. gun turrets, model 1909.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Right to Show Guarantee not Expressed in Sale Contract.—A written contract for the sale of a machine being complete upon its face, evidence as to any guarantee not contained in the contract is inadmissible. (New York Supreme Court, Appellate Term, American Multigraph Sales Company *vs.* Fred R. Jones & Co., 119 New York Supplement 1087.)

Rights of Buyer Asserting Breach of Warranty.—Where a buyer of machinery, on being sued for the balance of the price, asserts a breach of warranty and damages therefor, he cannot recover a partial payment made on delivery of the goods. (Texas Court of Civil Appeals, Erie City Iron Works *vs.* Noble, 124 Southwestern Reporter 172.)

Statement by Salesman not Constituting a Warranty.—A salesman's statement that the price charged for goods is cheaper than the buyer could procure elsewhere is only an expression of an opinion, and does not invalidate the contract, though false. (Michigan Supreme Court, Mayo *vs.* Latham, 123 Northwestern Reporter 561.)

Effect of Warranty by Wholesale Dealer.—An agreement for the sale of machinery by a wholesale, to a retail, dealer, which provides that it is subject to the warranties stated in the manufacturer's catalogue, constitutes a warranty by the wholesaler and not by the manufacturer. That a retailer does not inspect machinery promptly on its receipt does not preclude him from either setting up his claim for damages in a suit by the wholesaler brought to recover the purchase price or from bringing an independent suit for such damages, on his discovery after selling the machinery to a customer that it did not comply with the warranty under which it was sold to the retailer. (Iowa Supreme Court, Loxtercamp *vs.* Linninger Implement Company, 125 Northwestern Reporter 830.)

Seller's Remedies on Default by Buyer.—If one who has agreed to buy articles already manufactured refuses to accept them, the seller's remedy is a suit for damages and not for the purchase price, if the particular articles to be delivered have not been identified up to the time of the buyer's refusal. (Wisconsin Supreme Court, Lincoln *vs.* Charles Ashuler Mfg. Company, 125 Northwestern Reporter 908.)

Skill Required of Machinist.—One contracting with a machinist for the installation of an engine in a factory had the right to assume that the work would be done in a reasonably competent and diligent manner. (Michigan Supreme Court, Smith *vs.* Hertz & Hoshbach Company, 125 Northwestern Reporter 368.)

Damages for Breaching Contract to Buy Article.—As a rule, the measure of recovery for a buyer's breach of agreement to accept the article sold is the difference between the agreed price and the market value of the article at the time and place of delivery. A buyer can prevent the transfer of title to him by refusing to accept delivery and thus limit the seller's legal rights to recovery of damages for breach of the agreement to buy. (New Jersey Supreme Court, Massman *vs.* Steiger, 75 Atlantic Reporter 746.)

Representations Amounting to Warranty.—A clear and positive representation of the quality of an article sold, when made by the seller as part of the contract of sale and relied upon by the buyer, is a warranty for breach of which suit will lie, as distinguished from a mere expression of opinion. (Minnesota Supreme Court, Siegel *vs.* Barker, 125 Northwestern Reporter 582.)

Warranty of Engines Sold.—Where a manufacturer of an engine sold it with knowledge that it was to be used in the buyer's greenhouses and represented that it would be capable of performing the work for which it was bought, the buyer could recover the amount of damage actually and unavoidably done to flowers in the greenhouses through the engine's failure to work properly. One who buys machinery under a warranty must take reasonable steps to minimize his loss sustained through a breach of the warranty. (New York Supreme Court, Appellate Term, Ralph B. Carter Company *vs.* Fischer, 121 New York Supplement 614.)

Right to Convert Insolvent Buyer's Contract Into Lease.—A contract of sale of property partly executed by a delivery and partial payments made on the price cannot be converted into a lease, after the buyer becomes insolvent, so as to revest title in the seller as against the purchaser's creditors in bankruptcy. (United States District Court, Middle District, Pennsylvania, *in re* Rinker, 174 Federal Reporter 490.)

Rights of Buyer on Seller's Breach of Contract.—By accepting a pump weighing 27,400 lb. a buyer did not waive his claim for any damages sustained through breach of the seller's agreement to deliver one weighing 35,000 lb. One injured through another breaking a contract to manufacture, sell and deliver articles within a specified time can recover his damage, including gains prevented and losses sustained.

(Washington Supreme Court, Eichbaum *vs.* Caldwell Brothers Company, 108 Pacific Reporter 434.)

Right to Dispute Authority of Agent.—A seller of machinery who retained title until payment of the price could not dispute the authority of his agent to make an agreement to take the machinery back and cancel the notes given for the purchase price, where the seller received the machinery from the agent and retained possession. (Indiana Appellate Court, Reeves & Co. *vs.* Miller, 91 Northeastern Reporter 812.)

Measure of Damage for Breach of Warranty.—The measure of damage for a breach of warranty of an engine sold is the difference between its value as warranted and its real value, where the buyer used it more than two years. (Pennsylvania Supreme Court, Fowler Waste Mfg. Company *vs.* Otto Gas Engine Works, 76 Atlantic Reporter 20.)

Measure of Damage for Failure to Deliver Scrap.—Where defendant broke an agreement to deliver steel scrap and cast scrap, f.o.b. Bayonne, N. J., to be shipped to an iron company at South Bethlehem, Pa., the company properly reduced its damages by buying in a cheaper market than Bayonne and is entitled to recover only the excess of the price paid over the contract price, the freight from the place of purchase to South Bethlehem being the same as from Bayonne. (New York Supreme Court, Appellate Term, Fechheimer Iron & Steel Company *vs.* Bares, 122 New York Supplement 683.)

Measure of Damage for Breaking Contract to Sell Coal.—The measure of damages for breaking an agreement to deliver coal is the difference between the contract price and the market price when delivery should have been made. (United States Circuit Court, Western District of Pennsylvania, Youghiogheny & Ohio Coal Company *vs.* Verstine, Hibbard & Co., 176 Federal Reporter 972.)

Injunction Against Noisy Operation of Iron Works.—On suit to restrain the noisy operation of an iron works, an important question is whether the noise by any reasonable means can be so moderated as to conform to the degree of quietness plaintiff is entitled to enjoy, and, where it appears that the real annoyance was in the summer, when the windows and doors of the buildings were open, and when the work was done outside and at times in the evenings, a judgment in such general terms that obedience to it would result in the closing of the works should be modified to prohibit the operation of machinery of a noisy character between specified hours, and requiring the work inside the buildings to be done with the doors and windows closed. (Pennsylvania Supreme Court, Collins *vs.* Wayne Iron Works, 76 Atlantic Reporter 24.)

Foundryman as Expert Witness. Acceptance of Machinery Under Contract of Sale.—The mere fact that a witness was a foundryman did not qualify him to testify to the value of a molding machine. The machine was sold under no warranty other than that it had no mechanical defects, and the buyer was required under the contract of sale to test the machine and keep it or not, as he might choose; but if he did not keep it, he was to notify the seller within 30 days after starting it, and failure to so notify the seller was to be regarded as an acceptance. He gave no such notice. Held that he is liable for the price, though unable to make the machine do the work expected of it. (Texas Court of Civil Appeals, Carroll *vs.* Mitchell-Parks Mfg. Company, 128 Southwestern Reporter 446.)

Rights Under Sale of Machinery in Factory.—A sale of machinery in a factory implies a right in the buyer to enter the factory for the purpose of removing the machinery. Unless time for removal is agreed upon, removal must be made within a reasonable time. (Massachusetts Supreme Judicial Court, Barry *vs.* Woodbury, 91 Northeastern Reporter 902.)

Necessity for Reducing Contract to Writing.—In Florida no contract for the sale of personal property is valid unless the buyer accepts at least part of it, or pays something to bind the bargain or on the purchase price, or unless the agreement is evidenced by a writing signed by the parties to be charged by the contract or their agents. An entry in the seller's account book is not sufficient for this purpose. An express company transporting goods, whether under contract with the seller or the buyer, has no implied authority to do the act required to constitute an acceptance of the goods by the buyer, so as to avoid the necessity for a writing under the rule above stated. (Florida Supreme Court, United Hardware-Furniture Company *vs.* Blue, 52 Southern Reporter 364.)

Acceptance of Order by Partial Shipment.—Shipment of part of chains ordered shows acceptance of the order. (Indiana Appellate Court, Haskell & Barker Car Company *vs.* Allegheny Forging Company, 91 Northeastern Reporter 975.)

Statements Not Constituting Warranty of Thing Sold.—Statements which merely constitute praise or commendation or the seller's opinion, belief, judgment or estimate of the quality of an article sold do not amount to a warranty. (Arkansas Supreme Court, Cornish *vs.* Friedman, 126 Southwestern Reporter 1079.)

S. DIESCHER & SONS.

Mechanical and Civil Engineers,

PITTSBURGH, PA.

New Tools and Appliances

A New Model Milwaukee Shaper.—The Lutter & Gies Company, Milwaukee, Wis., has built an improved model of its Milwaukee shaper in which the aim of the builder was to secure strength and simplicity in all working parts. The base is of the pan type and is strongly ribbed internally to insure stiffness while it also projects well out from the column and affords a rigid foundation. The dimensions of the column are liberal and it is rigidly braced. The slides overhang at both ends, thus giving a long bearing surface to the ram, which has a quick return and is of strong construction. Eight feeds are provided, four by a 4-step cone pulley and the remainder by the back gears. The table is slotted on both the top and the sides and may be revolved to any position that may be required by loosening the bolts fastening it to the apron. T-slots are provided on the end of the apron so that the vise or the work itself can be clamped directly thereto after the table has been removed. The vise has a graduated swivel base and can be clamped to either the side or the top of the table. The tool head is graduated and swivels to any angle. The length of stroke is indicated by a pointer on the side of the machine and can be changed instantly by simply manipulating a large hand wheel located on the working side of the tool. The feeding mechanism is simple in construction and an adjustable table support is provided to eliminate all spring when doing heavy work. The bearings of the apron, ram and slides are provided with tapered gibs to secure the maintenance of the accurate fit originally given and the cross-rail screw has ball thrust bearings and micrometer collar reading to thousandths of an inch. Ball bearings are provided on the elevating screw nut for the saddle to eliminate friction as far as possible.

A New Hob Grinding Machine.—The Carpenter-Kerlin Gear & Machine Company, 77 White street, New York City, has added a new universal tool grinder for grinding hobs as well as other straight and spiral fluted tools to its line of gear cutting machines. This grinder is made in four sizes with and without automatic reversing power traverse to table, ranging in capacity from 25½ in. long by 7¼ in. in diameter to 31½ in. and 15¼ in. respectively. These machines are equipped with spiral dividing head for spiral fluted tools, internal grinding attachment, two tailstocks, one headstock with driver attachment for truing up the centers, guiding finger with foot and tension roller, and two hand rests and are arranged for either hand or drive grinding. They can also be furnished for motor drive. It is claimed that these grinding machines are rapid as well as accurate for the grinding of hobs and other straight and spiral fluted tools and are highly efficient in grinding bores and cylindrical work.

The Western Steel Corporation, Seattle, Wash., states that its blast furnace, which has been in operation at Irondale since July 10, has a present output of 90 tons daily. Two open hearth furnaces are in operation, also two rolling mills, one 14-in. and the other 22-in. Pig and scrap are being used in equal proportion in the open hearth furnaces. The entire plant is working successfully.

The Southington Hardware Company, manufacturer of hardware specialties, whose factory is at Southington, Conn., held its annual meeting of stockholders July 26, when the following officers were elected: James H. Pratt, president; J. H. Baldwin, secretary and treasurer. The marketing of the company's product will in the future be done from the factory.

The furnace of the Marting Iron & Steel Company, at Ironton, Ohio, was expected to blow in this week. It has been out since June 26.

The Pennsylvania Steel Company had three of its blast furnaces at Steelton, Pa., in operation August 1. No. 4 was blown out July 19.

Obituary

JOSEPH HOWARD, president and treasurer of the De Laney Forge & Iron Company, Buffalo, N. Y., died July 28, aged 82 years. He was born at Bury, Lancashire, England, and came to this country with his parents when he was 14 years old. The family settled in Fall River, Mass., and it was there, at a blacksmith's forge, that he laid the foundation of his practical knowledge in the working of iron and steel, which made him in after years the foremost smith of his time. This ability on his part was so generally recognized by the forge trade in America that, when an organization of the trade was made which needed as chairman of its Executive Committee a thoroughly practical forgerman, Mr. Howard was unanimously elected to this position, and he directed the practical workings of the organization for years. He went to Buffalo in 1868 to take an interest in the De Laney Forge & Iron Company. Since then he continued actively to direct the practical workings of the company, whose high position in complicated work is a monument to Mr. Howard's ability and teachings. He leaves two sons.

The Vanadium-Alloys Steel Company, Latrobe, Pa., recently appointed W. E. Snow, formerly in the engineering department of the Pittsburgh Gage & Supply Company, as its sales representative in Pittsburgh, to cover western Pennsylvania and southern Ohio. The company is also establishing sales offices in New York City, Philadelphia, Boston, Cleveland and Chicago. It manufactures Red Cut high speed steel, Vanadium steel for all purposes and regular carbon and alloy steels.

The New England Sherardizing Company has been organized at Hartford, Conn., with an authorized capital stock of \$30,000, and will establish plants for the Sherardizing process of dry galvanizing at Hartford and New Haven, Conn., and New York. The incorporators are: J. McA. Johnson and John F. Forward, Hartford, and C. L. Ganser, New Haven. The company has also bought from the United States Sherardizing Company, New Castle, Pa., the right to license other manufacturers to use the process.

The Berlin Machine Works, Beloit, Wis., is contemplating erecting in or near Seattle, Wash., a plant for the manufacture of woodworking machinery. The plant which it is proposed to erect will cover several acres and will involve an expenditure of about \$600,000, capable of employing at least 400 men. It is understood that the plant to be erected in Seattle will be a duplicate of the one just completed by the company at Hamilton, Ont.

A petition in bankruptcy has been filed in the United States District Court, Pittsburgh, against the Union Sheet & Tin Plate Company by five creditors, whose claims aggregate \$1,303.27. The company has a plant in operation at Marietta, Ohio, while a similar plant at Hazleton, Pa., is said to be idle. Arthur O. Fording, Pittsburgh, was appointed receiver, under bond of \$5,000.

The West Penn Steel Company, Brackenridge, Pa., has placed a contract with the Fort Pitt Bridge Works, Pittsburgh, for an addition, 80 x 150 ft., to its main sheet mill building. The company has also purchased some resquaring shears and leveling machines. These additions to plant and equipment have been made necessary by its rapidly increasing business in high grade steel sheets.

Vanadium in Cast Iron*

Good Results with Locomotive Cylinders

BY GEORGE L. NORRIS.

The entrance of vanadium into commercial metallurgy dates from about 1903 and the discovery of the rich deposits of vanadium ore in the Andes in Peru. Vanadium is probably the most powerful metal for alloying with steel. One or two tenths of 1 per cent. raises the elastic limit of mild carbon steel about 50 per cent., or more in some cases, without impairing the ductility. Vanadium steels have a very high dynamic strength, sustaining repeated vibrations better than any other steels. The greatest application of vanadium will doubtless continue to be in combination with steel, as here all its wonderful effects and qualities can be fully developed.

Cast iron may be regarded as a more or less impure steel, containing, in addition to the usual elements present in steel, a comparatively large quantity of carbon in the form of graphite interspersed throughout its structure in the form of granules, flecks or plates. The graphite destroys the continuity of the metal. In consequence the limit of strength of cast iron is low as compared with steel, and it also follows that any improvement conferred upon cast iron by an alloy must necessarily not be as great as in the case of more homogeneous steel. In cast iron, also, we have a metal that is subjected to no work or heat treatment to develop latent qualities.

Nevertheless the benefits which accrue from the incorporation of small percentages of vanadium with cast iron, especially in chill and cylinder castings, are very great, even if they are not so spectacular in their nature as those obtained in steel. Vanadium not only cleanses the cast iron from oxides and nitrides, but also exercises a very strong fining effect on the grain of the iron, with the result that porosity is eliminated and sound castings are produced. Strength, resistance to wear and rigidity are all increased by the addition of vanadium to gray cast iron, while the vanadium martensites are much tougher than ordinary martensites. In the case of chilled cast iron, vanadium produces a deeper, stronger chill, and one less liable to spall or flake. Chilled iron rolls containing vanadium have shown remarkably increased resistance to wear in service.

Vanadium in Locomotive Cylinders

As a result of two years' test on a pair of cast iron cylinders made of vanadium cast iron, the New York Central Railroad Company specified vanadium cast iron for the cylinders of 183 new locomotives built during the past eight months. The pair of cylinders under test gave upward of 200,000 miles, with only microscopical wear, whereas ordinary locomotive cylinders will show about 1-32 in. wear per 100,000 miles. These locomotives were built by the American Locomotive Company and comparative tests have been made between the iron containing vanadium and that to which no vanadium was added. The averages of 10 consecutive comparative tests are as follows:

| | Transverse strength. Pounds. | Tensile strength. Pounds. |
|-------------------------|---------------------------------|------------------------------|
| Plain cast iron..... | 2,130 | 24,225 |
| Vanadium cast iron..... | 2,318 | 28,728 |

The transverse tests were made on 1-in. square bars, 12 in. between supports; the bars were machined all over and consequently were absolutely comparable, as is not the case with bars tested as they are cast. The tensile tests were also of machined bars. In machining the vanadium cast iron cylinders, the effect

of the vanadium was noticed in the machining qualities of the iron; the chips were not so short, were tougher and showed considerable springiness.

Another concern making gas engine cylinders has recently reported comparative tests as follows:

| | Transverse strength. Pounds. | Tensile strength. Pounds. |
|-----------------------|---------------------------------|------------------------------|
| A Plain iron..... | 2,800 | 21,000 |
| AV Vanadium iron..... | 3,300 | 24,000 |
| B Plain iron..... | 3,487 | 25,000 |
| BV Vanadium iron..... | 3,770 | 27,650 |

These transverse tests were made on bars 1 in. square, 12 in. between supports, and we understand they were not machined. The "AV" and "BV" cast iron, containing vanadium, has stood 750 lb. water pressure with 3/4-in. thickness of metal.

The use of vanadium in cast iron will doubtless find its greatest field in engine cylinders, both gas and steam, where it will be of great value in increasing the life of the cylinder through its effect on the wearing qualities of the iron.

Tests of vanadium in malleable cast iron have been reported as satisfactory in every way, the fibre of the iron showing much cleaner and the tensile strength being improved about 12 per cent. The castings were also very much stiffer than ordinary malleable castings.

The Method of Adding Vanadium

In applying vanadium to cast iron, it must be remembered that nothing like the heat of molten steel is at hand; consequently one should use a finely crushed or powdered alloy of a low melting point. As the melting point depends directly upon the percentage of vanadium contained in the alloy, a ferrovanadium containing under 35 per cent. vanadium should be used. If the iron to be vanadized is melted in the air furnace, the procedure is a very simple one: After the charge is melted and 15 to 20 minutes before tapping, the ferrovanadium is added and the bath well stirred or rabbled.

Where the iron is melted in the cupola it is necessary to add the vanadium to the ladle, and, as the amount of heat available for dissolving the ferrovanadium is limited, the iron should be tapped out as hot as possible and a ladle used that has just been emptied in order to conserve as much heat as is practicable. After the bottom of the ladle is covered with a few inches of iron, the finely crushed or powdered ferrovanadium is added by sprinkling it on the stream of iron as it flows down the spout to the ladle. In this way advantage is taken of all the available heat, and there is also the mixing effect of the stream as it strikes the iron in the ladle. After the vanadium is added the contents of the ladle should be well rabbled and allowed to stand a few moments before pouring in order to insure thorough incorporation and complete reaction.

In the case of cupola iron, with its limited available heat, it has been found that the addition of 0.10 to 0.12 per cent. vanadium is all that should be attempted ordinarily; while in the case of high grade air furnace iron, with its reserve of available furnace heat, the addition of 0.18 per cent. to 0.20 per cent. is advisable and readily made.

The analyses of a great many tests show that about 70 to 80 per cent. of the vanadium alloys with the iron, the remainder being used up in cleansing the iron from oxides and nitrides. In remelting cast iron which has been vanadized, most of the vanadium is necessarily lost, owing to the very strong oxidizing conditions under which the iron is melted. The effect, however, of the small amount of vanadium remaining in the remelted iron is apparent in the texture of the grain and its consequent freedom from porosity.

Sarah Furnace of the Kelly Nail & Iron Company, Ironton, Ohio, was blown out in July and will be rebuilt.

* From a paper read at the May meeting of the New England Foundrymen's Association, at Hartford, Mass. Mr. Norris represents the Vanadium Sales Company.

The Peat Industry

The American Peat Society's Meeting at Ottawa, Canada, July 25 to 27

Promise of the possibilities in the peat industry of the United States and Canada is offered in the various circumstances in evidence at the Ottawa meeting of the American Peat Society, July 25, 26 and 27. Those in attendance witnessed the operations of producing fuel from the Government peat bog at Alfred, Ont., near Ottawa, and on the following day visited the fuel and fuel testing station where peat is being used in the economical production of power in a gas producer and electric generator. The aid given by the Dominion Government in the development of the peat industry was the subject of much favorable comment by the members. Several important iron and steel and industrial corporations considered the meeting of sufficient importance to have representatives present. The attention that has been given to the development of machinery and processes of handling were discussed at considerable length in the various sessions.

The first session on Monday morning was entirely devoted to business of the society, with the exception of a description of the Government peat plant at Alfred, Ont., given by A. Anrep, Jr., of the Department of Mines.

Visit to Government Peat Bog

In the afternoon a special train carried the delegates to Alfred to inspect the peat plant. The bog area comprises 7000 acres, of which the Canadian Government owns 300 acres. At the time of the visit the peat was being dug by hand from a trench 3 to 12 ft. deep, and placed on a conveyer which elevated it to the pulverizer. From this machine, in which it was macerated by a series of knives, it was discharged into cable operated cars and conveyed a short distance to another spot on the bog—the drying field. From the cars it was spread out in a layer about 6 ft. wide and 5 in. deep, and the field press, a simple arrangement of weighted rollers with a series of knives following, passed over it. Roller knives were drawn laterally over the layer of fresh peat, thus forming blocks about 10 x 5 x 5 in. The peat machine has a capacity of 25 to 30 tons per day. A visit was then made to points on the field where the peat in similar rows had been drying for about three weeks. In that time it had been turned once, and the visitors saw it being picked up and conveyed in cars to the storage sheds. When spread out originally it contained 90 per cent. moisture, and after air drying for three weeks the moisture had been reduced to 25 per cent., a degree of dryness suitable for fuel or use in a gas producer.

About 1600 tons of dried peat has been taken from the bog this season, and is to be sold for fuel.

According to figures supplied by Dr. Eugene Haanel, president of the society, the cost of the peat from the bog, including interest on capital invested, amortization, oil and repairs, is \$1.65 per ton loaded on cars.

Analyses of the Alfred peat, absolutely dry, show its composition as follows:

| | | | |
|----------------------|-------|------------------------|-------|
| Volatile matter..... | 68.23 | Sulphur | 0.218 |
| Fixed carbon..... | 26.00 | Phosphorus | 0.033 |
| Ash | 5.77 | | |
| Nitrogen | 1.76 | Calorific value B.t.u. | 9,005 |

The President's Address

In the evening President Haanel gave an address on "The Exploitation of Our Peat Bogs for the Production of Fuel for Domestic and Industrial Purposes." He pointed out that in Canada alone there are 37,000 square miles of peat bogs already known

and referred to the investigation conducted by the Dominion Department of Mines, and the report on the manufacture of peat for fuel and other purposes in the peat using countries of Europe. This investigation, he said, has demonstrated that for the economic production of fuel from peat, machinery must be substituted as far as possible for manual labor, and that drying peat by pressure and artificial heat have both failed. He considered that if Canada is to establish a peat industry only such processes and machinery as have proved successful in Europe should be introduced, and the development of new ideas should be left to the future.

Figures quoted by him show that Russia is the largest producer of peat fuel in the world. In 1902 the production was 4,000,000 tons, and since then there has been an annual increase of nearly 200,000 tons. Many private plants exist in Russia in connection with cotton mills for the production for their own use of 200,000 tons of peat annually. Thirteen hundred plants making machine peat are now in operation in Russia.

Adaptability of Peat for Gas Producer Use

Taking up the use of peat in gas producers, Dr. Haanel said:

Air dried peat is not alone an excellent fuel for domestic use, but for the production of power it proves an ideal fuel in the peat gas producer, which is to-day as reliable and efficient in its operation as the coal gas producer. I do not hesitate to say that it is an ideal fuel because the peat from most bogs is free from a clinkering ash and yields, on combustion, a fine white residue, which readily allows of the thorough cleaning of the fire, and the property of not fusing or caking in the producer assures regular operation. Moreover, since gas leaves the producer with a high degree of sensible heat, which must be cooled to the temperature of the atmosphere before being used in the gas engine, it is exceedingly important that as much of this sensible heat as possible be utilized in the producer itself, in order to increase its thermal efficiency. This is accomplished in coal gas producers by the introduction of water vapor, which passes through the incandescent fuel with the air supplied for combustion. This water vapor is decomposed, yielding hydrogen and oxygen. The latter combines with the carbon of the fuel, forming carbon monoxide. This chemical reaction absorbs a large amount of heat and lowers the sensible heat of the gas, but the heat absorbed in liberating the hydrogen is to a large extent restored and utilized when the gas, enriched by hydrogen, is burned in the gas engine or other apparatus. With peat containing from 25 to 30 and more per cent. of moisture, the moisture content is sufficient to accomplish all that is required without the introduction of water in the producer from an outside source.

Hon. Clifford Sifton spoke of the urgent necessity of utilizing the peat bogs of North America, and also on the conservation of our natural resources.

A Traction Trackless Peat Machine

Francis J. Bulask, Toledo, Ohio, read a paper on "The Work of the Peat Engineering Company." He stated that after an investigation of the processes and machinery used in foreign countries his company had designed a traction trackless peat fuel machine. A description of this machine showed it to be designed for the complete handling of the peat, including the digging from the bog, making or cutting it into small pieces, turning it during the drying process, and windrowing or piling it ready to be carted to the sheds.

A paper was also read by Dr. T. Arthur Mighill of Stone & Webster, Boston, Mass., on "Peat Power Generation," referring to some tests that had been

made with peat in the gas producer and relating some of the difficulties that must be overcome in its use.

Officers Elected

On Tuesday morning officers for the ensuing year were elected as follows: President, Dr. Eugene Haanel, Department of Mines, Ottawa; vice-presidents for Eastern States, John N. Hoff, New York City; Great Lakes and Mississippi Valley, Carl Kleinstueck, Kalamazoo, Mich., for Eastern Division, and L. B. Lincoln, Chicago, for Western Division; Southern States, Robert Ranson, St. Augustine, Fla.; Pacific States, C. V. Imeson, Los Angeles, Cal.; Canada, Dr. J. McWilliam, London, Ont.; New York Section, Dr. Charles F. McKenna, New York City; New England Section, O. E. Moulton, Dover, N. H.; Minnesota Section, Max Toltz, St. Paul; secretary-treasurer, Julius Bordollos, Kingsbridge, New York City.

Kalamazoo, Mich., was selected as the 1911 convention city.

Following the report of the editor of the *Journal of the American Peat Society*, it was decided to supply that journal hereafter to 1000 of the more important public libraries of the country. It was also voted to increase the annual dues of the society to \$5 per year.

A "History of the Peat Industry of Canada" comprised the subject of a paper by Alexander Dobson, in which a brief account was given of the various attempts to develop the peat bogs of Canada. In this paper it was related that, beginning in 1878, the peat bog near Farnham, Que., supplied for five years an entire division of the Grand Trunk Railroad with peat as fuel.

Results of Tests of Peat for Producing Power

In the afternoon, after an automobile tour of the city, the visitors were taken to the Government fuel and fuel testing station in Ottawa. At that station there has been erected a double fire zone Körting peat gas producer with the necessary cleaning apparatus and a Körting four-cycle single acting gas engine, direct connected to a Westinghouse 50-kw. direct current generators. While no official report is yet ready for publication, it is understood that the engineer in charge has succeeded in showing the development of one brake horsepower hour on 3 lb. of peat. This means that if the plant were situated at the bog a brake horsepower year could be developed at from \$7.50 to \$8.

President Haanel, in this connection stated that the erection of gas producers designed for the recovery of by-products is not recommended except in localities where such by-products would command a ready and profitable market. He added:

In Canada it is far more economical to aim at the complete gasification of all the heat elements in the fuel. Peat gas producers for power purposes should, whenever possible, be erected on the bog, and the energy generated in the form of electricity transmitted to neighboring towns and villages for power and lighting purposes as in the case of water power. This is the policy adopted in European countries. Whatever other valuable products may be obtained, such as moss litter, peat mull, alcohol, packing paper, millboards, ammonia and nitrates, the great and important need for us in Canada is the production from the peat deposits of a constant reliable supply of fuel for domestic and industrial purposes.

In the evening a complimentary banquet was tendered the delegates, at which Hon. Sidney Fisher, Member of Agriculture, was the chief speaker.

On Wednesday morning Ernest V. Moore, Peterborough, Ont., gave a description of a new portable peat gas machine, which has been designed to handle peat from the bog, and requires only two men to operate it.

Dr. J. McWilliam, London, Ont., gave some of his experiences in peat briquetting, and told of the diffi-

culties encountered in the wet process, as well as some of the obstacles to be overcome in the dry process.

The Mark process of drying peat was the subject of an interesting talk by C. E. Mark of the Mark Process Company, Chicago. This was followed by a lengthy discussion.

On Wednesday several of the members from Ottawa, prominent in the peat industry, started a movement which has assured the organization of a Canadian peat society.

Personal

E. R. Hibbard, president of the Grip Nut Company, Chicago, started July 28 on a 10 weeks' trip to the Orient.

T. Evans, for many years purchasing agent for the Cananea Copper Company, has been appointed manager of the Mine & Smelter Supply Company's branch office at Denver.

M. H. Godfrey, who has been for some years connected with Hibbing and Chisholm, Minn., iron mines, latterly being in charge of Chisholm district properties of the United States Steel Corporation, is the successor of John C. Greenway as superintendent of the Canisteo district. Mr. Godfrey's successor at Chisholm is Sullivan, formerly in charge of the Gilbert mine, Mesaba range.

H. S. Stebbins of Oglebay, Norton & Co., Cleveland, who received severe injuries in an automobile accident 10 days ago, is making a good recovery.

Wm. Wilkins, heretofore manager at Ashland, Wis., for the Lake Superior Iron & Chemical Company, has been transferred to the main offices of the company at Detroit.

Wm. G. Mathias, superintendent of the structural and blooming mills of the South Works of the Illinois Steel Company, has been appointed assistant general superintendent of the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala. His associates, through General Superintendent Wm. A. Field of the South Works, presented him with a set of flat silver, and there was also a presentation from employees in the mills of which he had charge. James Walsh succeeds Mr. Mathias at South Chicago, and John Caldwell has been given charge of the slabbing mill, succeeding Mr. Walsh.

Edwin F. Atkins of Boston was elected president of the Westinghouse Electric & Mfg. Company to succeed George Westinghouse, at the annual meeting July 29. Other officers were re-elected as follows: Robert Mather, chairman; E. M. Herr, L. A. Osborne and Charles A. Terry, vice-presidents; G. W. Hebard and H. D. Shute, acting vice-presidents; W. A. Esselstyn, secretary; T. W. Siemon, treasurer and assistant secretary; H. F. Baetz and E. St. John, assistant treasurers; James C. Bennett, auditor and controller; F. E. Craig and W. B. Coville, assistant auditors. It is stated that Mr. Atkins accepted the election to the presidency with the distinct understanding that his retention of the position is to be temporary and until the board shall select a permanent successor. Mr. Westinghouse remains a director, his time expiring in 1912.

Humphrey Bond of the metal house of Vivian Bond & Co., New York, has returned after a four weeks' absence in Europe.

H. A. Fennerty, purchasing agent of the Carnegie Steel Company, Pittsburgh, who is convalescing from a severe operation, sails for Europe August 4, on a month's absence.

Helen furnace of the Red River Furnace Company, Clarksville, Tenn., was expected to blow out this week.

Rusty Water Due to Poorly Galvanized Pipes

An Investigation at Springfield, Mass.

Numerous residents of Springfield, Mass., having complained to the local Water Board of the rusty condition of the water furnished to their houses, George C. Whipple, a New York engineer, was engaged to make an investigation. His report, which has been published in the *Springfield Republican*, is of much interest to manufacturers of wrought pipe, especially the following extracts taken from it:

The pipes used for the conveyance of the hot water were found to be chiefly of galvanized steel. Possibly in some of the older installations they may have been galvanized iron, but this could not be told from inspection. In one instance brass pipe was found in connection with a steel tank. In some of the private houses examined the hot water piping was of brass and lead and the boilers of copper. The quality of the galvanized pipe used differed considerably in different buildings. In some cases, especially the older installations, the pipe appeared to be of much better character than in the houses more recently built, the amount of zinc on the pipe being greater and the coating smoother. These pipes of better grade were almost invariably found in connection with galvanized tanks or with tanks covered with packing. The poorer qualities of galvanized pipe were usually found associated with the unprotected steel tanks, this being apparently a cheaper installation.

The Uncoated Interior of Galvanized Pipe

When it was found that the rusty water troubles were associated with the steel tanks and galvanized pipes of poor quality, an investigation was made to ascertain the character of the inside of some of the galvanized piping used in Springfield. Samples were obtained from various plumbers and dealers, from the stock of pipe in the water works yard and from pipes used in other cities. These samples were sawn asunder, so as to expose the interior. The results, taken as a whole, showed extremely bad conditions. Scarcely a single specimen of a perfect pipe was obtained. In some cases there were large areas on the interior of the pipe entirely uncoated with zinc, and where the steel was exposed and coated with rust; others were spotted with pieces of mill scale embedded in the zinc coating; others were rough from the presence of dross from the spelter bath; sometimes a line was found along the seam where the coating had not adhered to the pipe, possibly on account of the failure of the acid to remove the mill scale during the process of galvanizing. In several pipes where the coating was good, as far as the eye could see, microscopical and chemical tests showed the presence of pin holes where rusting might occur.

A number of years ago wrought iron pipe was largely used for house services. The zinc coating on such pipe was usually better than that found on modern steel pipe. Whether this is due to the nature of the metal or to differences in the process of galvanizing it is not necessary to discuss here, but that there is on the market to-day a very large amount of poorly galvanized steel pipe seems evident from our observations. It is still possible to obtain galvanized iron pipe, but it costs more than steel and is said to be more troublesome to get, so that practically it is little used.

The Trouble Not Due to the Water, but Unprotected Metal

It seems certain from our observations that the cause of the rusty condition of the hot water is not due to the water itself, but rather to the unprotected metal of the steel tanks and pipes used in distributing the hot water in certain buildings. Apparently both the tanks and pipes contribute to the trouble. In one

instance where a steel tank was used in connection with brass piping the trouble existed, though not in as serious form as elsewhere. In this instance it must have been due to the action of the hot water on the metal of the tank. In other instances pieces of galvanized pipe were examined which had been taken from the primary circulating system. These pipes showed evidences of serious pitting and corrosion. There were numerous spots where the metal had been eaten into so as to reduce the thickness of the pipe by 30 to 40 per cent. These pipes were almost completely choked with iron rust. Most of this iron rust came from the pipe itself, for it was present in the form of tubercles, each tubercle covering a pit in the steel.

It hardly seemed credible that so much iron rust could be derived from the pipe itself, but experiments showed that each volume of metallic iron was capable of producing upward of 10 volumes of iron rust in a moist condition, and calculations showed that in order to completely fill a 1½-in. pipe it would be only necessary to have the metal of the steel reduced on an average by less than 1-27 in., in a 1-in. pipe by 1-40 in., in a ¾-in. pipe by 1-52 in., and in a ½-in. pipe by 1-80 in. In some of the specimens examined the loss of metal must have been even greater than this. Calculation has also shown that a corrosion of the inside of the steel tanks amounting to only 1-100 in. would be sufficient to cause a rusty condition of the hot water for an entire year. It is evident, therefore, that it is perfectly possible for the observed conditions to originate within the hot water distribution system of the apartments.

Pipe Deposits Almost Wholly Iron Rust

The accumulated deposit in the pipes consisted almost exclusively of iron rust. The percentage of organic matter was extremely small, very much smaller than would have been the case if the deposits had been caused by mud derived from the mains. Part of the iron rust was in the form of the ordinary red oxide, but part of it was in the form of magnetic oxide. This was especially the case at the bottom of the tubercles, where the supply of oxygen was obviously limited. The black appearance of this magnetic oxide would at first glance give one the impression of being organic matter. The samples of hot water analyzed in the houses where trouble has occurred showed a marked decrease in the amount of dissolved oxygen, indicating that the oxygen had been used up in oxidizing the iron. In some cases also there was a very slight reduction in the amount of dissolved free carbonic acid in the hot water and a slight increase in the alkalinity.

From the coincidence of the rusty water trouble and the presence of steel tanks and galvanized pipe of poor quality; from its absence under other conditions; from the generally bad character of the galvanized steel pipes now in the market; from the pitted condition of galvanized pipes examined; from the analysis of the deposits in the pipes themselves, and from the loss of oxygen in the hot water, it seems reasonable and inevitable to conclude that the rusty water is due, not to the character of the water supplied, but to the use of unprotected steel tanks and imperfectly galvanized steel pipes for distribution of the hot water.

In justice to the plumbers it ought to be stated that the equipment used for distributing hot water in the apartments where trouble has existed is used extensively in other cities with apparent success. In New York City and Brooklyn, for example, it is said to be common. In Boston, however, and in most cities of eastern New England, galvanized piping is almost universally avoided for hot water services. Where the water is hard, or even moderately hard, corrosion does not appear to be a serious matter except where other corrosive salts, such as the chlorides, for example, are present. With the softer waters of New England, however, unprotected or poorly protected steel cannot be used for hot water without trouble.

Trade Publications

Elevating and Conveying Machinery and Industrial Railways.—C. W. Hunt Company, West New Brighton, N. Y. Catalogue No. 102. Briefly describes the various types of machinery built by this company. This includes coal-handling and hoisting machinery, conveyors, industrial railways, electric locomotives, electric and steam hoists and Manila rope. There are numerous illustrations showing installations of the various pieces of apparatus, and in many cases under the engraving there is a brief statement of the principal points of interest about the installation.

Electrical Machinery.—Triumph Electric Company, Cincinnati, Ohio. Two loose leaf circulars. Concerned with induction motors and small generating sets for private lighting, which are a cheap, economical and reliable source of light for small factories, private residences, steamboats, farms, &c.

Special Track Work.—Conley Frog & Switch Company, Memphis, Tenn. Catalogue No. 2. Relates to a line of special track work for steam, electric, mining, logging, sawmill, plantation and industrial railroads. This includes a number of types of frogs, switches, turnouts and crossings. A number of switch stands, rail braces, slide plates, tie rods and head chairs are also illustrated.

Portable Sawmill.—American Portable Band Saw Mill Company, Winston-Salem, N. C. Treats of a new type of portable sawmill having a band saw instead of the circular saw ordinarily employed. Some of the advantages claimed for this mill are a saving in the amount of timber, as it is stated that the part now wasted in sawdust by the old type of circular mill is saved because of the narrowness of the cut; fine finish on the product, as the lumber is sawed so smooth that sandpaper rubbed lightly over the surface removes all saw marks and makes it ready for paint, thus eliminating loss in planing, and cheapness of operation, as only three men are required and two of these can be ordinary laborers. The log remains stationary on the truck frame, which rests on the ground, and the saw carriage travels to the log and feeds the saw into it and reciprocates over the log until it is sawed to the proper dimensions.

Gondola Dump Cars.—The Ralston Steel Car Company, Columbus, Ohio. Booklet. Treats of a special type of level floor drop bottom car with which coal, ore, sand, gravel or light material can be dumped either from a trestle or the ordinary track level very quickly and at the same time enables the car to be loaded with lumber, bar iron, sewer pipe, brick and material of this nature that cannot be conveniently loaded in hopper cars. The illustrations show the under frame of the car, a skeleton view, side views with the doors up and down, an end view, the car equipped with a coke rack, interior views with the doors in both positions, a cane car, and a general service box or stock car with drop doors.

Pneumatic Hammers.—Ingersoll-Rand Company, 11 Broadway, New York. Form No. 8003. Devoted to the Imperial type E pneumatic hammers, which are built in a number of different sizes for scaling, chipping and riveting. There is a brief description of the construction of these hammers, supplemented by illustrations of the different types. This description is followed by a set of instructions on the care of the tool and a brief table of specifications and sectional views giving the names and repair numbers of the various parts are appended.

Friction Clutches.—The Hill Clutch Company, Cleveland, Ohio. Catalogue No. 8. Calls attention to the improvements which have been made in the Hill clutch since the original model was placed on the market in 1886. The standard clutch pulleys and cut-off couplings are illustrated and described and a table of dimensions is appended. Space is also given to a list of repair parts and accessories, such as hand levers and fulcrum stands, clutch operators, quills, collar oiling bearings and belt tighteners.

Steel Lockers.—S. Keighley Metal Ceiling & Mfg. Company, 819 Locust street, Pittsburgh, Pa. Circular. Pertains to a line of steel lockers built on the unit system in sections or groups in a single row, double rows with a single back, and in single or double tiers. The material employed is heavy cold rolled steel reinforced at the edges and center with angles and bars. The doors are equipped with a simple three-way locking device which securely fastens the door at the top, center and bottom and is operated by a Yale & Towne or other lock or a keyless or time combination lock. Flat tops are regularly furnished, but if desired a sloping one can be made to order.

Buckets.—Andresen-Evans Company, 1501 Monadnock Building, Chicago, Ill. Folder. Illustrates a type of grab bucket for handling ore, coal, sand, gravel, crushed stone and similar material, which is intended to replace the orange peel bucket formerly used.

Steam Engines.—Providence Engineering Works, Providence, R. I. Bulletin S-75. Relates to the Rice and Sargent Corliss engine. The details of construction are described very thoroughly, especially those features which are said to enable operation at higher speeds than the other types now on the market. Data is given regarding the amount of floor space re-

quired, horsepower ratings and the amount of power transmitted by rope drive. The illustrations in the bulletin show some of the different parts of the engines and a number of installations.

Turbine Blowers.—L. J. Wing Mfg. Company, 90 West street, New York City. Bulletin No. 7. Illustrations and descriptive matter explain the operation of the Typhoon turbine blower, which is a combination of a propeller type blower and a steam turbine. Some of the advantages claimed where this blower is used for furnishing the draft in a boiler plant are the use of smaller sized and less expensive fuel, the development of additional power by increasing the rate of combustion, which in some cases will enable one or more boilers to be shut down, and the maintenance of an almost constant steam pressure.

Generators and Fixtures for Acetylene Lighting Systems.—Acetylene Apparatus Mfg. Company, 50 Church street, New York City. Two catalogues. The first, No. 11, deals with the Pilot generator for producing acetylene, in which the carbide is fed to the water. The feed in this generator is a forced one, operated by a weight motor, in which the rate of feed is such that the gas is generated faster than the carbide is fed to the water. Three models varying only in size are shown, and the illustrations include exterior and sectional views of the entire generator as well as details of the various parts. The other catalogue, No. 12, is devoted entirely to fixtures and supplies for an acetylene lighting system, and the illustrations are of various types of fixtures, shades, fittings and accessories.

Electric Pyrometers.—The Brown Instrument Company, 311 Walnut street, Philadelphia, Pa. Catalogue No. 3. Pertains to the line of electric pyrometers for indicating or recording all ranges of temperature made by this company. This includes two fixed instruments having circular and square scales, one portable model for indicating and a recording pyrometer which traces the temperature record on a circular chart. The thermo-electric couples used with these instruments are shown and space is also given to the Brown radiation pyrometer, which is designed for use above the limit of the electric instrument with platinum thermo-couple inserted directly in the heat. A number of suitable equipments for different industries requiring a pyrometer and a partial list of users are appended.

Packing.—New York Belting & Packing Company, Ltd., 91 Chambers street, New York. Catalogue. Deals with the numerous styles of packing manufactured by this company for practically all the different conditions encountered by an engineer. The various kinds illustrated include oval and spiral piston rod packing, diagonal expansion packing, waterproof hydraulic packing, hot water spiral plunger packing, packing for piston rods and throttles, and a number of combination packings designed for use where the conditions are such that one type of packing alone will not give satisfactory service. In addition to these styles, red, white and black sheet packing, asbestos metallic sheet packing, asbestos and cloth gaskets, pump diaphragms and valves, hard rubber valve disks, gauge glass rings, bib disks and washers, air hose coupling and lubricator glass gaskets, and asbestos wick are also illustrated and described. A partial list of other goods manufactured and a complete index of the goods covered in the catalogue both by style numbers and names are appended.

Metal Working Machinery and Oil Separators.—American Tool & Machine Company, 109 Beech street, Boston, Mass. Describes and illustrates an extensive line of lathes, valve milling machines and oil separators. The lathes include turret models with swings ranging from 26½ in. and an 8-ft. bed to 18½ in. and a 6-ft. bed. Other types shown include two square arbor lathes and two models of set over and back motion lathes. Two styles of milling machines for brass valves are shown and a number of accessories are also illustrated. The line of oil separators includes two belt-driven models having capacities of 520 and 2540 cu. in., respectively, and an electrically driven machine having the same capacity as the smaller belt-driven one. In the make-up of the catalogue the illustrations appear on the left-hand page, while the facing pages contain descriptions of the machines illustrated.

Sand and Lime Brick Machinery.—American Sandstone Machinery Company, 321 North Hamilton street, Saginaw, Mich. Catalogue. Illustrates and describes the Komnick system for making bricks from sand and lime, for which the advantages of greater resistance to fire and greater strength are claimed. The process of making the bricks is described briefly, and there are a number of illustrations of the different machines and other accessories used. A number of photographs of structures constructed of sandstone brick complete the catalogue.

Railroad Equipment.—Gould Coupler Company, 341 Fifth avenue, New York City. Loose leaf catalogue. Size 9¼ x 12 in. Illustrates the various specialties manufactured by this company, which include couplers, vestibules for trains, continuous platforms and buffers, friction draft gear, trap door rigging, journal boxes, draft beams and coupling brackets, steel bolsters, axles and sills and side frames. The illustrations show the different sizes made of each piece of equipment, and include half-tones showing the general style of each piece and its various parts, supplemented by line drawings showing the differences in the dimensions of the various sizes.

The Eastern Pig Iron Association at Port Henry

A Visit to Witherbee, Sherman & Co.'s Properties in the Eastern Adirondack District—Important New Mining and Concentrating Operations

One of the most notable of the many visits of representatives of the iron industry to the Adirondack iron ore district was made last week. Starting with an invitation from Witherbee, Sherman & Co., Inc., to the members of the Eastern Pig Iron Association to hold their July meeting at Port Henry as the guests of the company, the plans for the excursion were widened to include in the party various consuming interests outside the association. A special train of five Pullman cars and two private cars was provided for the trip, leaving the Grand Central Station, New York, Tuesday evening, July 26, at 9.39. At Albany it was transferred to the Delaware & Hudson Railroad, and Port Henry was reached early Wednesday morning. Leaving New York at the close of a day of high temperature and humidity, the travelers found the cool morning air along the Lake Champlain shore entirely agreeable. Their first view of the Adirondacks on the west and of the distant ranges of Vermont across the lake was an introduction to a day whose scenic features were no less noteworthy in their way than the mining operations which were the special object of interest.

A Historic District

The magnetite of the Lake Champlain or Adirondack Mountain region has never held so important a position in the 25 years of the country's marked advance in iron manufacture as it holds to-day. The story of iron mining and iron production in that district is of exceeding interest. The pioneers there, finding deposits of iron ore and available waterfall, secured sufficient financial support to erect forges where the raw mineral was converted into blooms by the use of charcoal made in the adjacent woodlands. Though this history is embraced in but little more than a century, these forges and the blast furnaces subsequently erected have passed away, and in a number of instances their exact locations are in dispute.

That magnetite in quantity exists in the Adirondack region is evidenced by the mining operations which have been or are now carried on in an area extending from the Chateaugay and Arnold Hill mines on the north to Ticonderoga and Fort Ann on the south, and from the Cheever mine on the east to the Benson mines on the west, offering the prospect of large future reserves. Another No. 21 mine, with its vein of rich ore from 300 to 400 ft. thick, may not be encountered, nor may another bunch of phenomenally pure ore be found, such as was developed at Lover's Hole, in Barton Hill, from which over 30,000 tons of 70 per cent. Bessemer ore was taken, and many superb octahedral crystals obtained. Nor may there be as great exposures as those exhibited by the titaniferous ore deposits at Tahawus, 40 miles west of Port Henry, described in *The Iron Age* of October 14, 1909. However, some of the bases of supply for the older forges may be developed into producing mines, for of the territory above generally defined only limited portions can be considered as having been explored.

The Cheever mine was recognized as a source of ore in 1804, from the outcrops of which the neighborhood drew its supply, and later when the Lake Champlain Canal aided transportation such names as Ausable, Essex, New Russia, Schroon, Horicon, Crown Point and Ticonderoga were well known in the iron trade, especially for horseshoe nails and other specialties.

Subsequently the railroad encouraged the construc-

tion of blast furnaces to use anthracite coal, and these contributed material from which the earlier steel rails were rolled. The equipment of some of the plants was in advance of the times, the largest, and at that date the most economical, blowing engines being features.

The first installation of firebrick hot blast stoves in America was made at the Cedar Point furnace at Port Henry, the only one of the older plants which has survived, yet it shows its youthfulness by a large output made with phenomenally low fuel consumption—a necessity where distance from coal mines creates high freight charges—and by the turbine driven blast apparatus lately installed. This furnace is demonstrating the possibilities of using a charge of all rich magnetite with excellent results. The only other active blast furnace in the Adirondack region is at Lyon Mountain.

The first use of a closed front by an American blast furnace, the first establishment of a furnace laboratory, and the continuous production of 2300 lb. of pig iron with the consumption of 1600 lb. of charcoal, are credited to the Fletcherville furnace, now only a memory.

A Record of Enterprise

Similar evidences of progressiveness have been constantly shown in mine equipment in the Champlain district, for 30 years ago the hoisting plant at Mineville was a "show" installation which attracted many visitors. Diamond drills, air compressors and electrically operated machinery were adopted early in this district, and nowhere in the United States has magnetic concentration been more thoroughly studied and more practically demonstrated.

History repeats itself in the story of concentration, for 60 years ago the famous No. 21 mine was purchased for a few hundred dollars as a source of phosphorus, and crude magnetic separators were operated to obtain the apatite for shipment abroad, the iron being a by-product. To-day the modern concentrating mills are operated to enrich or purify the ore, and some of the phosphorus tailings are disposed of for fertilizers or sold to blast furnaces whose ore supply contains insufficient phosphorus to produce satisfactory foundry pig iron. Thousands of tons of Harmony mine tailings have been shipped for this purpose to Central Western furnaces, these containing 10 to 12 per cent. iron and 9 to 10 per cent. phosphorus.

The record of iron ore mining in the district shows many failures, and the blast furnace history is mainly one of disasters. But the wonderful development at Mineville and the successful operation of blast furnaces at Port Henry and Lyon Mountain demonstrate that persistence and progressive management, backed by ample capital, may be expected to bring success in other portions of the Adirondack region.

So much has been written of the Witherbee, Sherman & Co. properties, that in what is said below of the trip of last week it is the aim to refer chiefly to the more recent developments.

INSPECTIONS IN AND ABOUT PORT HENRY

The Power House and the Crown Point Park

After Wednesday morning's breakfast, which was served on the special train, the visitors were conducted first to the Port Henry power house of Witherbee, Sherman & Co., located on the lake shore. The building was erected in 1907 of monolithic concrete, 6 parts mine tailings to 1 of cement. The stack is 175 ft. high and 8 ft. inside diameter of reinforced concrete.

There are 1864 hp. Babcock & Wilcox boilers equipped with superheaters, McClave shaking grates and Wing turbine blowers. The fuel is No. 2 buckwheat anthracite. Two General Electric vertical Curtis turbines generate electric current at 6600 volts, 25 cycles. An 800-kw. generator was installed in 1907 and one of 1500 kw. in 1909. Steam is used at 165 lb. pressure and 100 degrees superheat. Auxiliary equipment includes a Wheeler surface condenser and pumps. The cost of power is stated to be 0.9 cent per kilowatt hour when generating 500,000 kw. hour per month. From this power the greater part of the requirements of the mining and concentrating operations at Mineville are supplied.

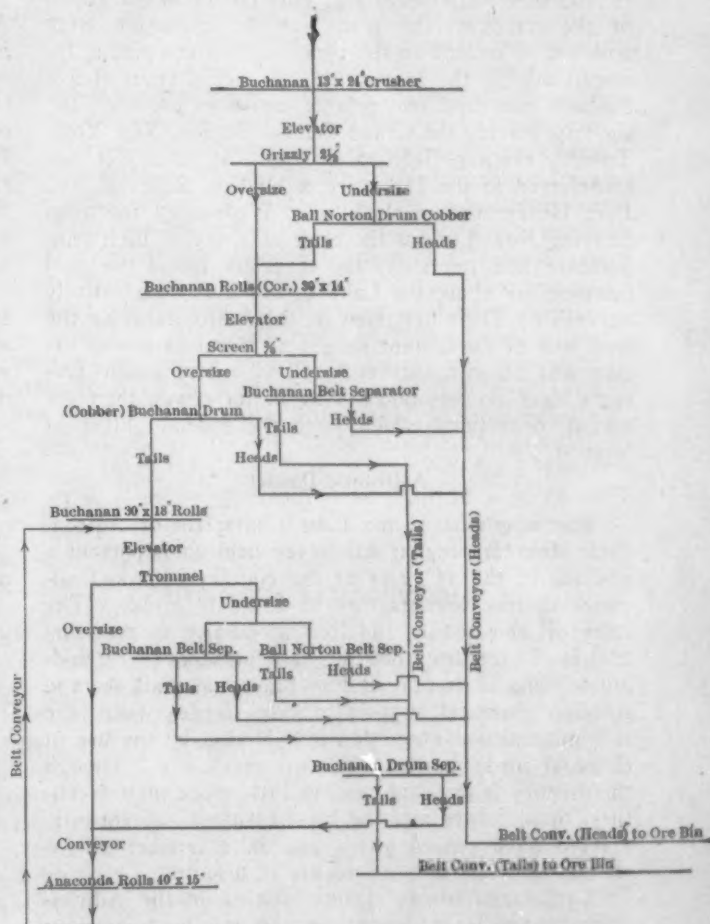
The party divided after the power house inspection, the majority taking ferry for Crown Point, that historic strip of New York State land, which intrudes upon Lake Champlain just below Port Henry. Witherbee, Sherman & Co. gave the Crown Point Park to the State of New York early in 1910. In it are the ruins of Fort St. Frederic, built by the French in 1731 and the ruins of Fort Amherst, built by the English in 1759, about both of which so much interest gathered at the time of the Champlain tercentenary celebration last year. Several million dollars were spent on these fortifications. On a Government site adjoining the park the monument to Champlain commemorating the three hundredth anniversary of his discovery of 1609 will be erected. The iron nails in some of the woodwork of the fortifications attracted the attention of the visitors for their size and shape as well as their holding properties. Several of them were carried away for chemical analysis.

The Cheever Mine

The alternative morning trip, which a smaller party took by automobile, was to the Cheever iron mine, about two miles north of Port Henry. This property, in which the Bethlehem Steel Company acquired a 51 per cent. interest last year, Witherbee, Sherman & Co. having the remainder, has an ore body entirely distinct from those of the Mineville district. The old Cheever Iron Company dates back to 1820, though ore was taken from the Cheever in Revolutionary War times. From 1853 to 1883 the mine was operated to supply ore to the Bay State Furnace, a charcoal stack at Port Henry, and then for over 20 years it was abandoned, being reopened in 1906. Present operations at the Cheever are in charge of A. E. Hodgkins, general manager, formerly of Witherbee, Sherman & Co. Ore is being raised through both the Weldon and Tunnel shafts, the former overlying the other. The present depth of mining is about 350 ft., measured vertically, or 1400 ft. on the slope. The company will soon operate a third shaft on the south side of the old workings, which will increase the output to nearly 700 tons of crude ore, instead of 400 tons a day. An electric haulage system will also be installed for a portion of the old working, which will be reached by a drift of about 400 ft. from the Weldon shaft. One electric locomotive and a supply of 3-ton cars will be provided. An air hoist will be installed to raise the gate of the underground ore bin. For hoisting from the third shaft, referred to above, the company is putting in a double drum Lambert hoist, operated by a 75-hp. General Electric motor. The present steam hoisting plant at the Weldon and Tunnel shafts is being replaced by a double drum, Wellman-Seaver-Morgan electric hoist, driven by a 225-hp. General Electric motor, the new plant being started this week. In line with the plans of the new owners to substitute electricity for steam a 1400 cu. ft. Ingersoll-Rand compressor, electrically driven, was installed a few months ago and four electrically driven pumps. For auxiliary hoisting underground three single drum, 37-hp. electric hoists were provided. The company derives current from the Port Henry power house of Witherbee, Sherman & Co. at

6600 volts, cutting it down to 440 volts for hoisting and 110 volts for lighting.

The concentrating mill at the Cheever Mine is operated by a 150-hp. General Electric motor, which drives the crusher, cobbing machines and belt and drum separators. From the crusher the ore is passed over a 2½-in. grizzly. All that passes through the latter goes to a cobbing machine of the Ball-Norton drum type, from which the heads are taken by belt conveyor to the shipping bins. The overs from the grizzly and the tails from the cobbing machine pass to a set of Buchanan corrugated rolls, 14 by 30 in. The ensuing repeated operations of screening, magnetic separation of undersized ore, cobbing of over-



Flow Sheet of Magnetic Concentrating Mill, Cheever Iron Ore Company.

size, and the successive magnetic separations are indicated on the accompanying flow sheet for this plant.

About 65 per cent. of the shipping ore from the Cheever is cobbled ore running 58 per cent. in iron, 10 to 12 per cent. silica and 2 per cent. lime. The ore as it passes from the concentrating mill goes to the loading bin, which has 350 tons capacity. Two 4½-ton cars are sent down each trip over two gravity planes, 800 and 1900 ft., respectively, to the loading dock of the Delaware & Hudson Company, where the ore is dumped into a chute and thus loaded into railroad cars. The average of the concentrates is 60 per cent. iron and 0.15 per cent. phosphorus.

The Cedar Point Furnace

In the latter part of the forenoon the Cedar Point furnace of the Northern Iron Company was visited. Built in 1872, this furnace is owned by Witherbee, Sherman & Co., and is operated under lease by the Northern Iron Company (T. I. Crane, president; W. S. Pilling, secretary and treasurer, and F. E. Bachman, general manager). For years this furnace has been a point of interest to engineers who have visited Port Henry, and its management has always been progressive. The present party had looked forward with par-

ticular interest to an inspection of the six-stage centrifugal General Electric Company compressor recently installed to replace the reciprocating blowing engines of this plant. The compressor is driven by a 1500-kw. steam turbine engine, and its normal capacity is 22,000 cu. ft. of air per minute at 15 lb. pressure, with an arrangement for automatically increasing the pressure up to 25 lb. The furnace has lately been operated with a blast pressure of 9 lb., but at the time of the visit this was down to 4 lb. A slip had occurred two or three days previous, following a change from a foundry iron to a basic iron burden. From having every tuyere frozen after the accident the management had succeeded in opening two, and rapid progress toward regular work was made on Wednesday, so that by night seven out of nine tuyeres were open. The visitors, while not able to see the regular operation of the turbo blower, were much interested in an inspection of the machine itself, which is a duplicate of the installation made early this year at the Oxford, N. J., furnace of the Empire Steel & Iron Company. These are the only two furnaces in the country to be so equipped thus far. Since the turbo blower at Port Henry has been installed the furnace has produced foundry iron ranging from 1.5 per cent. to 3 per cent. in silicon; thus exact comparisons cannot be made with the work of the reciprocating blowing engines, which was chiefly on basic iron. However, the claims of smaller steam consumption have been well borne out, as well as those of more regular working, due to the constancy of volume and pressure of the blast. Much reduced expense for lubrication is another advantage. The Cedar Point furnace is 69 ft. 3 in. high, with diameters of 10 ft. 6 in. at hearth, 17 ft. at bosh and 10 ft. 6 in. at stock line. The mixture is all magnetite, principally concentrates.

THE MINEVILLE PROPERTIES

After luncheon, which was served on the train, a start was made early in the afternoon for Mineville, six miles northwest of Port Henry on the Lake Champlain & Moriah Railroad. This road was built in 1868 and is owned chiefly by the Port Henry Iron Ore Company and Witherbee, Sherman & Co.

The usual grade from the lake level at Port Henry to Mineville is about 200 ft. to the mile, or about 4 per cent. Thus the power cost of hauling loaded ore cars to the docks at Port Henry is low. The roadbed is ballasted with ore tailings and laid with 90-lb. rails. The company is substituting 55-ton steel cars for its old equipment. In the first six months of 1910 the ore tonnage over this road was 437,825 tons. On the way to Mineville the train was run out upon the Y switch, over which several years ago a train of seven loaded ore cars made a flying leap of 340 ft., resulting in the complete wrecking of cars and locomotive. Details of this remarkable accident were given in *The Iron Age* of May 4, 1905.

The New No. 3 Concentrating Plant

What particularly impresses itself upon the visitor to Mineville is the amount of new construction and improvement work under way, as well as the thoroughly well kept condition of plant of all descriptions. It is estimated that fully \$800,000 has been spent in new construction and machinery for Witherbee, Sherman & Co.'s properties in the past two years. The most important of the surface improvements made in the past year is the new No. 3 concentrating plant built to treat the ore from the Harmony mines. The Harmony ore is siliceous, and as mined runs 40 to 60 per cent. iron. The concentrates are about 63 per cent. in iron and 0.10 to 0.15 per cent. in phosphorus. The new separator was built so that ore could be taken direct from the mines, saving the present switching cost and leaving both Nos. 1 and 2 mills for the Old Bed ore. As the visitors saw the new mill all the machinery was turning, but no ore was being treated,

and thus close observation of all machinery was possible without the clouds of dust encountered at the other mills. Some description of the equipment and of the flow of the ore through the mill will be of interest.

An 18 x 30 in. Blake crusher at B shaft and a No. 8 Gates crusher at A shaft take the ore from small bins in the pit head and crush it to 4 in. It is then carried up a 16-degree incline on 20-in. Robins conveyors to a 1500-ton cylindrical concrete bin, 50 ft. high from floor level, 21 ft. in diameter, and located midway between the two shafts. Of this storage 1100 tons will run out by gravity into a shaking feeder at the floor level, which feeds a continuous bucket elevator. From the head of the latter the stream is divided between two rotary screens, having 2-in. round holes. The rejections go to two No. 6K Gates crushers, and then back to the screens. The ore passing through screens goes to the first separator, a drum, Ball-Norton cobbing machine. With the ordinary run of Harmony ore, the first cobbles remove one-third to one-half of the stream as heads. The tails go to 42 x 16 in. special heavy Anaconda rolls, and then are elevated to two screens making 1/4-in. ore, which goes to a double deck type Ball & Norton separator, and 1-in. ore, which goes to another pair of drum cobbles.

The rejections from the screens and the tailings from the cobbles go to a pair of 40 x 15-in. Anaconda rolls and are elevated back to screens. The tailings from the belt machine go to a third pair of 40 x 15-in. Anaconda rolls, and thence over another belt machine to make the final cleaning of the tailings, after which the tailings go to the pile or to railroad cars, as desired. The concentrates from all machines go up an elevator into shipping bins over a railroad switch, or may be put into a stock pile, which may be enlarged to hold 100,000 tons. The mill is designed to treat 85 tons of ore per hour, if it is desired to grind it all to 1/4 in. or finer. For the ordinary run of ore it is expected the capacity will be 150 tons per hour.

By a special elevator and double bin it has been arranged to take one set of rolls and one belt machine out of the regular train and use them for making high grade concentrates, running 70 to 71 per cent. iron. To do this some of the regular ore is run into one-half of the double bin. This is drawn back into rolls and over the belt separator and up into the other half of the bin. This can then be repeated until the desired purity is attained. The average analysis of the Harmony concentrates is 62 per cent. iron and 0.12 per cent. phosphorus, and the present output is about 900 tons per day, with a capacity for 1500 tons per day.

The new separator building is of concrete blocks (reinforced through the air spaces), with monolithic concrete columns and floors, reinforced with old steel hoisting rope. In all 50,000 ft. of old hoisting rope was used, embedded in concrete. The building is 54 x 150 x 50 ft. high to the under side of the roof truss, with motor room 52 x 26 x 25 ft. and switch-board room 26 x 16 1/2 x 25 ft. It has 30-in. square pilasters, 13-ft. centers, with 10-in. curtain wall between. The concrete floors are designed to carry 500 lb. per square foot. The building contains 600,000 cu. ft. of space, and the cost was about \$35,000, or under 5 cents per cubic foot. The retaining walls and foundations cost \$5000 additional. The total cost of the whole installation was about \$160,000.

The mill is driven by two 200-hp., two-bearing, 440-volt, 3-phase, 25-cycle, 500-rpm., variable speed, induction motors, operated by reversible controllers. As a reserve a 300-hp., 440-volt, 250 to 500-rpm., induction motor was installed, and the shafting was so arranged that this can be substituted for either of the other motors. A 50-kw. motor generator set furnishes direct current for magnetic separators and lights. The set consists of a 125-volt, compound wound, d. c. generator, direct connected to a 440-volt induction motor.

Transformers and switchboards are all in a separate room and the panel controlling the magnetic separators carries an ammeter, fuse switch and regulating rheostat for each separate machine.

At A shaft a 35-hp., 440-volt, variable speed induction motor with reversible controller drives the crusher and a 20-hp., 440-volt, constant speed induction motor drives the conveyor taking ore to the bin, while a duplicate outfit drives the crusher at B shaft and the conveyor to the bin.

Bessemer Ore from Barton Hill

The most important development work now in progress at the Mineville group is at Barton Hill, whose summit is nearly 1800 ft. above the Lake Champlain level. One opening after another has been made in years past on the outcrop of the Barton Hill vein, one of these being the famous Lovers' Hole, from which 30,000 tons of Bessemer ore running 70 per cent. in iron was taken. The tunnel has been driven in a distance of 2300 ft., practically all in ore, and intersects in turn the various openings referred to, none of which have been worked in recent years. The tunnel will make it possible to take out the ore and water at a lower level. While a very considerable body of ore exists in the portion of the vein above the tunnel, diamond drilling has shown that a large portion is below the tunnel. The cores from this drilling show the continuity of the vein and the uniformity of the ore. Some of that thus far taken out through the tunnel is characterized by large crystals. The crude ore runs about 50 per cent. iron and 0.04 to 0.06 phosphorus. Concentration should give 67 per cent. iron and 0.01 per cent. phosphorus. The importance of this new operation, both to Witherbee, Sherman & Co. and to the Lackawanna Steel Company, which has a one-third holding in the former company, is apparent, in view of the lowering iron and rising phosphorus content of the ores now depended upon by the Bessemer steel industry of the country. Electric tramping, hoisting and pumping systems are being installed at the Barton Hill mine, and a separator will be built at the entrance of the tunnel.

Other Mineville Plants

Most of the other features of the afternoon trip at Mineville have been made more or less familiar to our readers by the descriptions which have already appeared in these columns. The open pit of the Port Henry Iron Ore Company, for example, which shows the outcrop of the famous No. 21 mine, was illustrated in *The Iron Age* of February 17, 1910, the same article being accompanied by a view of the No. 1 and No. 2 concentrating mills at Mineville, the electric hoist at Harmony Mines, and the Curtis turbines at Port Henry. A new hoisting and compressor plant at Clonan shaft of the Port Henry Iron Ore Company attracted considerable attention. The shaft is vertical, has three compartments, concrete lined and its foot is 541 ft. below the surface. A steel head frame has a storage capacity for 600 tons of furnace ore, 100 tons of crushed ore, 100 tons of lump ore and 300 tons of rock. The hoisting plant has a capacity for hoisting 2000 tons of ore in 24 hours from a depth of 1000 ft. The hoisting engine is of the duplex, direct acting Corliss type, with 20 x 42-in. cylinders. Two drums 7 ft. in diameter carry 1000 ft. of 1½-in. plow steel rope on one wind. The drums are driven by steam operated band friction clutches, and there are steam and hand brakes. Brake is applied automatically in case of overwind, and the throttle is also automatically closed. The rope speed of the hoist is 1500 ft. per min. at 110-lb. pressure. The compressor plant is of the Sullivan type, straight line compound steam and two stage air, 16 x 28 x 24 in. and 14½ x 24 x 24 in. The hoisting plant was furnished by the Sullivan Machinery Company.

A new installation at the central power plant of

Witherbee, Sherman & Co. at Mineville is a 750-kw., low pressure turbine. The exhaust steam is taken from the Corliss engine and passes from the turbine to an Alberger surface condenser. This addition will increase the generating capacity of the station about 50 per cent., with about 30 per cent. economy of coal consumption. In case of accident to the Corliss engine the turbine can operate under high pressure steam direct from the boiler.

The Mineville office building of Witherbee, Sherman & Co. was built in 1907, of concrete blocks from separator tailings. Here the party was shown models of the mines, indicating the extent of the underground workings and the shape of the ore body at various depths and distances from working shafts. Among the cabinet specimens at the offices was a famous octohedral iron crystal taken from Lovers' Hole, for which the Smithsonian Institution at one time made an offer of \$300, it being the largest iron crystal known.

Features of the various Witherbee, Sherman & Co. properties visited were explained by officers of the company, by S. Norton, the veteran superintendent at Mineville, and by S. Le Fevre, assistant superintendent. At the Port Henry Iron Ore Company's details were given by H. N. Brinsmade.

Wednesday Evening

A climax to the generous entertainment which made the entire trip memorable was a delightful reception given informally at the home of F. S. Witherbee, at Port Henry, Wednesday evening. The guests on this occasion added to their information concerning the turbo blower they had seen at the Cedar Point blast furnace in the forenoon, a number of lantern slides being shown, with sections of the six-stage compressor, by R. H. Rice and F. A. Larkin of the General Electric Company. A number of questions as to economies were asked and answered. H. B. Cox of the Empire Steel & Iron Company was called upon and, without having figures at hand, spoke of the results secured with the installation at the Oxford, N. J., furnace. Among the economies he referred to the fact that considerably less steam was required and a portion of the boiler capacity at Oxford is now out of commission. A very marked reduction was also noticed in the consumption of lubricant. An increased output of iron has been secured at Oxford also, but details were not given as to the extent to which the new blowing equipment is responsible for this.

The return train to New York left Port Henry at 11 o'clock Wednesday night, and with its arrival at the Grand Central Station Thursday morning terminated a highly successful and instructive excursion. To most of the visitors it brought a revelation of the great resources of the Port Henry district, and emphasized the progressive spirit which has marked the working out of its problems.

Members of the Party

H. E. Andrews, Lackawanna Steel Company, New York.
E. S. Atwater, Poughkeepsie Iron Company, Poughkeepsie, N. Y.
F. E. Bachman, Northern Iron Company, Port Henry, N. Y.
John Birkinbine, Philadelphia
George W. Blanchard, Boonton Iron & Steel Company, Boonton, N. J.
A. E. Borie, New Jersey Zinc Company, New York.
R. P. Bowler, Guantanamo Exploration Company, New York.
Horace Boyd, Thomas Iron Company, Easton, Pa.
H. N. Brinsmade, Port Henry Iron Ore Company, New York.
D. F. Bush, Crocker Brothers, New York.
Robert Bull, New York.
S. H. Chauvenet, Berkshire Iron Works, Sheriden, Pa.
E. A. S. Clarke, Lackawanna Steel Company, New York.
H. B. Cox, Empire Steel & Iron Company, Catasauqua, Pa.
H. G. Dalton, Pickands, Mather & Co., Cleveland.
G. C. Davies, Pilling & Crane, Philadelphia.
Warren Delano, Lackawanna Steel Company, New York.
J. F. Dery, Witherbee, Sherman & Co., New York.
J. F. Desmond, B. Nicoll & Co., New York.
William Dette, Crocker Brothers, New York.
A. I. Findley, *The Iron Age*, New York.
Wallace T. Foote, Witherbee, Sherman & Co., Port Henry, N. Y.

L. W. Francis, Witherbee, Sherman & Co., New York.
 A. W. Francis, New York.
 S. S. Freeman, Carbon Iron & Steel Company, Parryville, Pa.
 James Gayley, New York.
 H. F. Hallman, Warwick Iron & Steel Company, Pottstown, Pa.
 G. F. D. Hallman, Reading Iron Company, Reading, Pa.
 W. W. Hearne, Matthew Addy & Co., Philadelphia.
 August Heckscher, New Jersey Zinc Company, New York.
 R. M. Heckscher, Richard Heckscher & Sons Company, Philadelphia.
 Geo. A. Howells, Ingersoll-Rand Company, New York.
 E. L. Herndon, Eastern Steel Company, Pottsville, Pa.
 F. P. Huntley, Gould-Coupler Company, New York.
 J. E. Johnson, Jr., Republic Iron & Steel Company, Birmingham, Ala.
 J. R. Jones, Alan Wood Iron & Steel Company, Philadelphia.
 F. A. Larkin, General Electric Company, New York.
 A. H. Lee, Lackawanna Steel Company, Buffalo.
 C. H. McCullough, Lackawanna Steel Company, Buffalo.
 Alfred Marshall, Juniata Furnace & Foundry Company, Philadelphia.
 M. L. Seaman, American Bridge Company, Pencoyd, Pa.
 J. B. Moss, American Steel & Wire Company, Worcester, Mass.
 W. J. Mullin, Delaware & Hudson Railroad Company, Albany, N. Y.
 Augustus Munson, Wharton Steel Company, Wharton, N. J.
 A. D. Paine, Jr., New York.
 J. Hervey Patton, Harrisburg Pipe & Pipe Bending Company, Harrisburg, Pa.
 W. C. Pearson, D. G. Gautier & Co., New York.
 Leonard Peckitt, Empire Steel & Iron Company, Catsauqua, Pa.
 C. P. Perin, New York.
 W. B. Perley, United States Steel Corporation, New York.
 W. S. Pilling and J. R. Pilling, Pilling & Crane, Philadelphia.
 A. W. Powers, Cohoes Rolling Mill Company, Cohoes, N. Y.
 Veryl Preston, Eastern Steel Company, New York.
 R. H. Rice, General Electric Company, Lynn, Mass.
 Thomas Robins, Jr., Robins Conveying Belt Company, New York.
 James P. Roe, Glasgow Iron Company, Pottstown, Pa.
 C. M. Schwab, Bethlehem Steel Company, New York.
 C. S. Sims, Delaware & Hudson Company, Albany, N. Y.
 A. P. Smith, Boonton Iron & Steel Company, Boonton, N. J.
 H. S. Snyder, Bethlehem Steel Company, New York.
 H. B. Spackman, Lukens Iron & Steel Company, Coatesville, Pa.
 C. J. Stark, *Iron Trade Review*, New York.
 J. S. Stillman, Empire Steel & Iron Company, Catsauqua, Pa.
 Noah H. Swayne, Rogers, Brown & Co., Philadelphia.
 F. A. Wilmot, American Tube & Stamping Company, Bridgeport, Conn.
 W. L. Wolfe, Lackawanna Iron & Steel Company, Lebanon, Pa.
 Howard Wood, Alan Wood Iron & Steel Company, Philadelphia.
 Dr. J. McG. Woodbury, General Electric Company, New York.
 Philip E. Wright, Thomas Iron Company, Philadelphia.
 Walter C. Witherbee, Witherbee, Sherman & Co., Port Henry, N. Y.
 F. S. Witherbee, Witherbee, Sherman & Co., New York.

Canada's Market for Foundry Iron

TORONTO, July 20, 1910.—An item of the Canadian tariff that is likely to be reduced if the promises of tariff revision and of reciprocity negotiations Sir Wilfrid Laurier is making in the West are fulfilled, is that prescribing the duty on pig iron. Of that material the imports are steadily increasing. In the first two months of the current fiscal year, which opened April 1, the quantity of pig iron imported was 38,953 tons. Of this 21,653 tons came from the United Kingdom, 17,179 tons from the United States and 91 tons from other countries. The two marked features about the pig iron importations are their increasing magnitude and the increasing proportion coming from the United Kingdom. There was a time, not many years ago, when British pig iron sank to a very small place in the country's imports, and when it seemed that Canada would soon be producing all the pig iron required by its consumers. United States iron had displaced British iron, and Canadian iron, made from imported ore, was bidding fair to displace United States iron. But there has been a great change since then. The demand in Canada has swollen into much larger dimensions, the home supply, though also very greatly increased, is for the most part absorbed in steel making, and the British preference together with favorable ocean rates has tilted the advantage to the side of the British maker.

Canada's foundry industry has undergone marked development in recent years. The material required

is not to be obtained from domestic makers in anything like adequate supply, and the importation of foundry grades has grown fast. Of the new foundries most are engaged in producing articles for which certain grades of pig iron are needed. That fact may also have something to do in turning the demand to the British market. The trade returns indicate that the British iron brought into the country is cheaper than the American, the 21,653 tons of British iron being entered at \$277,697 and the 16,953 tons of American coke iron at \$252,199. This makes an average price of a shade under \$13 a ton for the British iron and \$14.87 a ton for the American. The duty is \$1 a ton in favor of the British iron, the general tariff rate—to which the American iron is subject—being \$2.50 a ton, and the preferential rate being \$1.50 a ton.

Foundry interests, whose protection under the tariff is quite moderate, are not loath to pay duties on their raw material if thereby they conduce to the growth of an adequate home supply of the material. But the home supply of foundry grades of pig iron falls shorter instead of increasing. The foundrymen have to pay the duty on their pig iron without seeing that there is any consequential growth of blast furnace output on foundry account. As it is, the farming portion of the community upon which the foundry interests depend for a market, and as the farmers are calling for the free entry of implements, the foundrymen cannot be blamed if they ask for free pig iron. At present the prospects for a greatly enlarged output of Canadian foundry pig are not encouraging. The furnaces at Sydney are likely to be kept busy supplying pig iron for the steel works there. If the Hamilton Steel & Iron Company builds a new furnace, as is projected, its additional output will probably be required for the production of the steel which the works of the several companies included in the Canadian Steel Company will need. The furnaces of the Algoma Steel Company will have all they can do to keep pace with the company's demand on steel rail account. The duties on the staple articles made of steel being generally sufficient for protection, and the demand for steel in the country steadily expanding, the drain on the furnace for the rail mills, rod mills, plate mills, &c., will be likely to increase. At the same time the demand for castings will go on enlarging and the consumption of the foundries will increase. Importation of foundry grades must therefore also increase or the home manufacture of such grades must become much greater than it is.

C. A. C. J.

The Lake Superior Mining Institute

A more detailed announcement is made by the secretary, A. J. Yungbluth, Ishpeming, Mich., of the fifteenth annual meeting of the Lake Superior Mining Institute, which will be held at Ironwood, Mich., Wednesday, August 24. The day will be spent in visiting various mines on the Gogebic Range and a business session will be held in the evening. At 11 p.m. a special train will be taken for Chicago and Gary, Ind., where the plant of the Indiana Steel Company will be visited. On Thursday there will be a brief inspection of the shops of the Chicago & Northwestern Railroad at Chicago, and later the plant of the Sullivan Machinery Company, 1170 West Lake street, will be visited. A trip will be made by automobile to the warehouse of Joseph T. Ryerson & Son, Sixteenth and Rockwell streets, where luncheon will be served, followed by an inspection of the warehouses and connected shops. Thursday evening a business session will be held at Gary and the visit to the steel works will occur on Friday. On Friday evening a banquet will be held at the Auditorium Annex, Chicago. At Ironwood the headquarters for the meeting will be at the Ironwood Club.

The Allis-Chalmers Gas Engine Blowing Unit

Large Order Recently Shipped to Canada

The accompanying illustrations show the two component parts of the Allis-Chalmers standard gas engine blowing unit. Fig. 1 is a view of the gas engine, and

power for driving the various motors around the plant. The other four engines are to be connected to the new Slick blowing tubs shown in Fig. 2. These tubs are 48 x 64 in. and are arranged for duplex operation on the opposite side of the main shaft from the engine. Each blowing unit has a capacity of 25,000 cu. ft. per minute when running at 72 rev. per min., but can be speeded up to 85 rev. per min. if necessary. The gas for the engines will be supplied from the blast furnaces

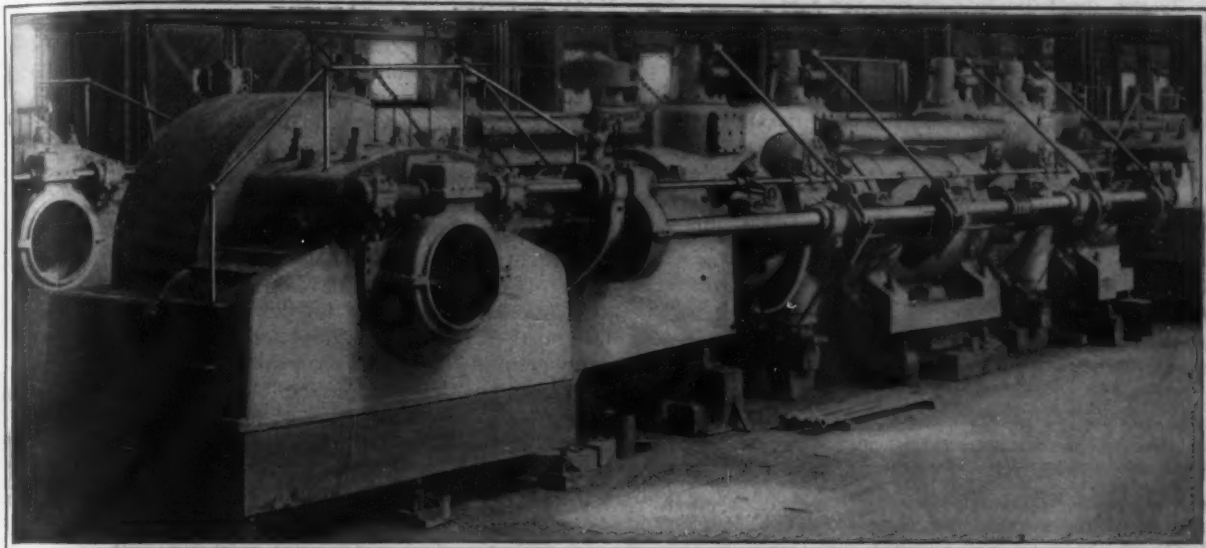


Fig. 1.—The Gas Engine Used in the Gas Engine Blowing Unit, Built by the Allis-Chalmers Company, Milwaukee, Wis.

Fig. 2 shows the Slick blowing tub for which the engines furnish power.

During the past few months the Allis-Chalmers Company, Milwaukee, Wis., has shipped two of these units and four gas engine generating sets to the Lake Superior Iron & Steel Corporation at Sault Ste. Marie, Ontario, Canada. In addition to the above equipment, two more blowing units are being constructed and are

of the plant. While some idea of the size of these units can be secured from the engravings, perhaps a better idea will be obtained when it is stated that each unit has an approximate weight of 1,000,000 lb., and to transport it from the shop at Milwaukee, where it was built, to its destination 12 large size flat cars were required.

These gas engines are being installed in a large extension of the Lake Superior Iron & Steel Corporation's plant, which when completed will make the works the largest steel producing plant in Canada and also the most modern. The improvements include greatly increasing the capacity of the original rail mill and the erection of new plate and merchant mills, together with the construction of a large coke oven plant. The latter consists of 110 ovens of the Koppers type, arranged in two batteries of 55 each. These ovens are 37 ft. between the doors, 17 in. at the pusher end, 21 in. at the quenching end and 9 ft. 10 3/4 in. at the top of the arch. The yield of coke per oven, it is estimated,

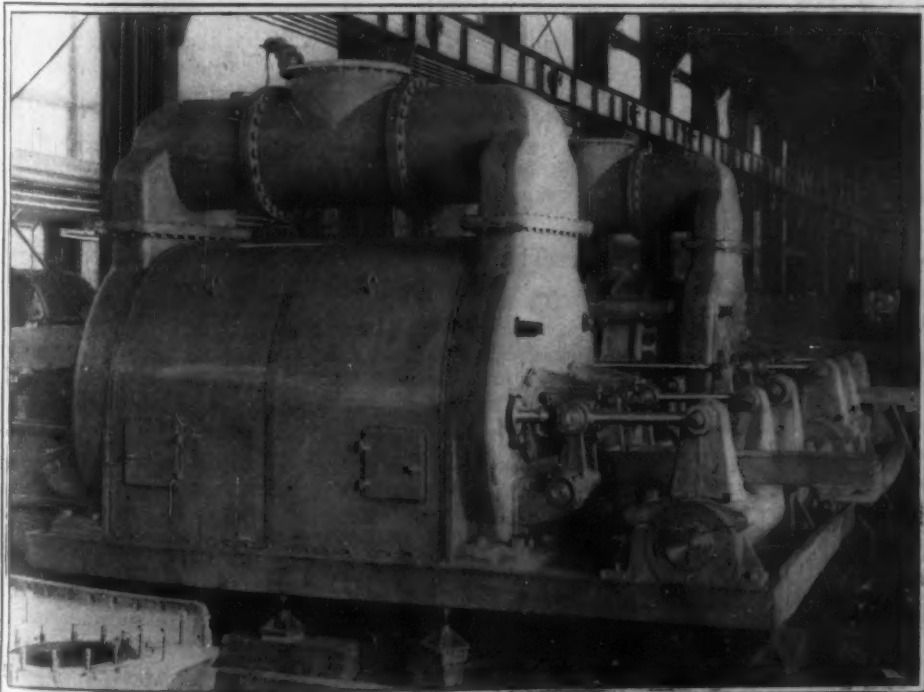


Fig. 2.—The Slick Blowing Tubs Forming a Part of the Units Shipped to Canada.

rapidly nearing completion. The gas engines are all alike, being of the twin tandem four-cycle type, with cylinders 34 x 48 in. and conform to the builder's standard in all respects. Four outfits are direct connected to 1765-kva. 25-cycle three-phase 2300-volt alternators running at a speed of 107 rev. per min. and supplying

will be nearly 1200 tons per day and approximately 10,000,000 ft. of surplus gas will be available for the generation of industrial power. A brief description of the coke oven plant was printed in *The Iron Age*, December 9, 1909. It will greatly increase the efficiency of the works.

The Collin Regenerative By-Product Coke Oven

A Successful German Type Recently Introduced in This Country

Germany has perhaps been noted more than any other country for the development of means and ways for utilizing by-products. One of the devices which has reached a high state of development there is the coke oven, and one of the most prominent builders is F. A. Collin of Dortmund. The first Collin oven was built in 1868, and the latest design of oven embodying the regenerative principle was perfected about three years ago and is now being introduced in America by the Coal Distillation Company of America, Singer Building, New York City. The principal features of the construction of this oven are shown in Figs. 1 and 2, which are longitudinal and transverse sections, respectively, while Fig. 3 illustrates the distribution of heat in various types of ovens.

The advantages claimed for the system of heating employed in this oven are as follows: First, the uniform heating of the entire oven wall length is assured because each vertical heating flue is heated continuously by burning live gas with hot air, the quantities of each being under perfect control. Second, the products of combustion do not have to travel along a top horizontal flue connected with all the vertical ones in

of a higher oven chamber with greater coking capacity without the danger of overheating the bottom of the chamber. Fourth, the placing of the regenerators outside the oven battery is advantageous because the temperature of all regenerators is constantly changing, and the consequent movement of the checker work and walls is not transmitted to the ovens themselves.

The oven chambers are formed of special firebrick and are rectangular in general outline, with a small taper toward the discharge end. The coal is introduced through charging holes in the top, and is leveled by a leveling machine, operating through a small door at the top of one oven end. The gases evolved during the coking of the coal leave the oven chamber through a pipe in the middle of the oven top, and are conducted to the by-product plant, whence part of the thoroughly cleaned gas is returned to the ovens for coking fresh charges of coal. A battery of these coke ovens is connected to two sets of regenerators placed outside the battery itself, and in their turn communicate with a chimney for producing the necessary draft.

The heating of the ovens takes place in two phases or periods. The gas having been returned from the

by-product plant through gas mains at either end of the ovens, is in the first period introduced into distributing chambers by six pipes for each oven wall, three at either end, provided with cocks for regulation. In these distributing chambers the gas is not mixed with air and therefore not burnt.

From these six distributing chambers the gas ascends through slots into each vertical heating flue as indicated by the arrows, Fig. 1. At the bottom of these heating flues and in a plane with the sole of the oven are ports *p*, through which air is admitted that has been brought to about 1000 degrees C. by first passing through the regenerators outside the oven battery and then through the rectangular firebrick passages *r*, located underneath the entire battery of ovens and running at right angles to

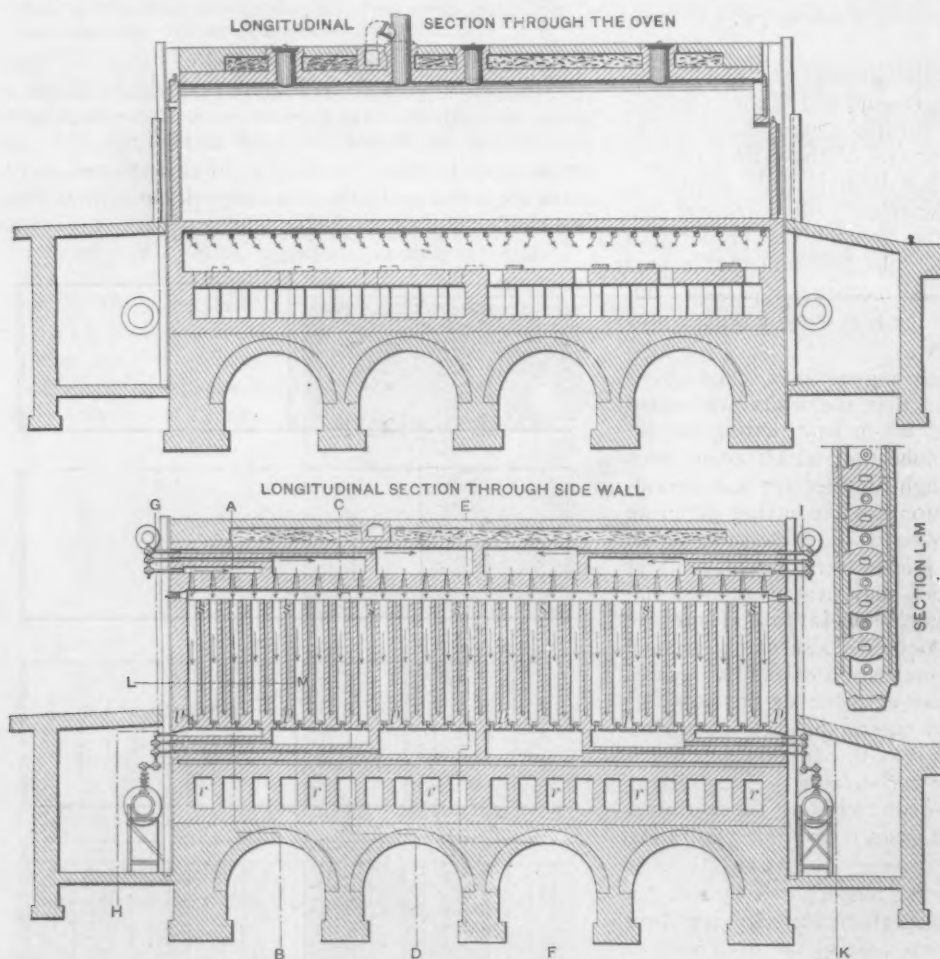


Fig. 1.—Sectional Elevation of the Regenerative By-Product Coke Oven, Designed by F. A. Collin, Dortmund, Germany.

order to reach that leading to the regenerators. On the contrary, each flue has its own individual flue for the products of combustion immediately adjoining, and the gases have therefore a short, unobstructed passage under equal suction to the chimney. Third, in the Collin oven the coking chamber is alternately heated from the bottom and the top, this method permitting the use

the oven chambers. This air, on entering, causes combustion of the live gas in each flue. The amount of air and the draft are regulated by dampers in the flues under the oven soles. The flames pass up the heating flues and descend through the adjoining flues *s*. The products of combustion then pass through the two sole flues of each oven and finally into one-half of the

rectangular passages r , where a large portion of the heat is absorbed. These passages lead to the regenerator, where the remainder of the heat is given up. The gases leaving the regenerator retain only sufficient heat to produce the necessary chimney draft.

When this heating has proceeded for a certain period, generally half an hour, the flow of gas and air is reversed. The gas then enters at the top of the

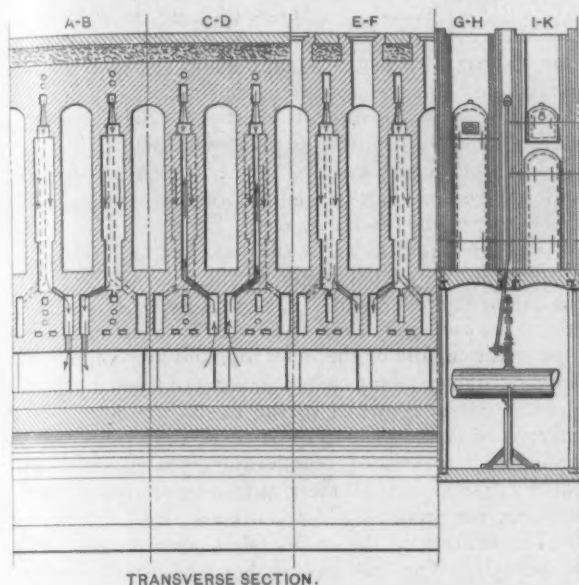


Fig. 2.—Sections at Various Points in Fig. 1.

oven and the gas inlets at the bottom are closed by an automatic reversing arrangement, which also changes the direction of the air by turning a wing valve in the chimney flue. At the upper end of these flues the gas is met by the air which has been heated by passing through the second of the outside regenerators and then through the passages in the ovens. The products of combustion again enter the sole flues and thence pass through the other half of the rectangular passages underneath the sole flues into the first outside regenerator and finally to the chimney.

The principle on which regenerative coke ovens have hitherto been built is that the walls are heated alternately by live gas and waste heat, letting the incandescent products of combustion which come from one set of flues pass through another set and periodically reversing this operation. After having given up part of their heat to the oven walls, these products of combustion, still at a high temperature, enter chambers of checkered firebrick, which they heat to redness and leave at a comparatively low temperature. There are two such regenerators which are alternately heated. The air required for the combustion of the live gas in the oven flues is passed through one or the other of these hot regenerators and enters the flues at a temperature of about 1000 degrees C. In this way much less live gas is required for carbonizing a given charge than in the waste heat oven without regenerators, where the heat of the burnt gases is used for generating steam.

This method of heating the ovens partly by live gas and partly by waste heat and periodically changing these two sources of heat from one part of the oven wall to another, as is done in some types of regenerative coke ovens, is said to possess serious drawbacks. In the first place, the heat of the products of combustion is less than the heat of the flame itself. Hence, it follows that the part of the oven heated by the direct flame will be hotter than that warmed by the waste heat. Aside from affecting the quality of the coke and increasing the time required for the coking process, this constant variation in the heat supplied to the oven walls affects the brickwork, and regenerative ovens of this kind have a shorter life and require more repairs than waste

heat ovens which have no regenerators, generally speaking.

A further drawback to some regenerative ovens is the unequal distance the heating gases have to travel in different parts of the oven and the unequal drafts thus caused which produces differences in the heat of the various flues. To illustrate this, the top diagram, Fig. 3, shows the mode of heating an oven wall in two well-known systems of regenerative coke ovens, the shaded portion indicating the part of the oven wall heated directly by gas, the unshaded portion that warmed by the products of combustion. As all gases naturally take the shortest route to the chimney, it is obvious that the flues nearest to either side of the middle division will have the strongest draft and will carry the bulk of the hot gases. A smaller quantity is thus left for the flues nearer the ends of the oven and as a consequence the oven will be hottest in the middle.

Another firm of regenerative oven builders has recognized this defect and tried to remedy it by dividing the oven walls into four parts. The second section of Fig. 3 shows this mode of heating, the shaded portions again indicating the parts of the oven wall heated directly by live gas and the unshaded ones those heated by the products of combustion. Another type of regenerative oven has been constructed in which the principle of subdividing the oven wall into parts heated directly by live gas and by the products of combustion has been still further carried out, as shown in the third section in the diagram. This is an improvement, but it does not eliminate the drawback that the different parts of the oven walls are alternately heated by live gas and the products of combustion.

As will be seen from Figs. 1 and 2, and the foregoing description, this type of oven has a system of flues constantly heated by direct flames, which in one period travel upward from the lower part and downward from the top in the other period, but always heating the same flues in both. The products of combus-

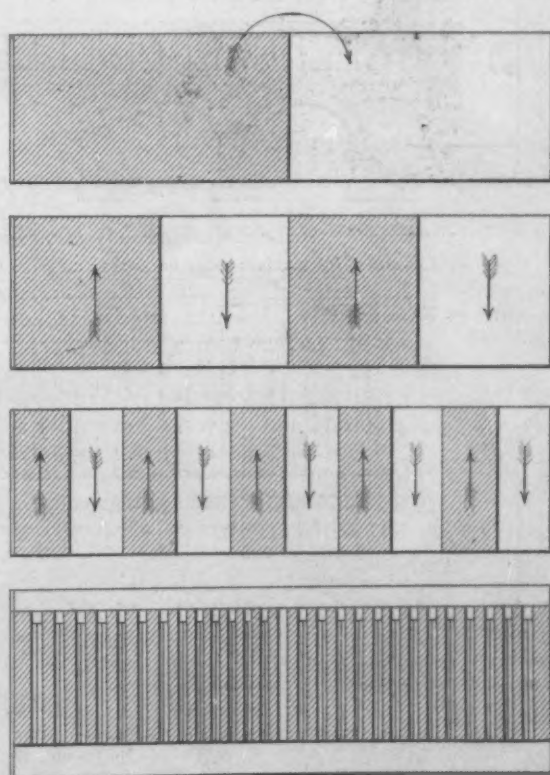


Fig. 3.—Diagrams Showing Methods of Heating the Walls of Regenerative Ovens in Common Use.

tion in this oven are drawn off in a set of special flues, one of which immediately adjoins each heating flue. These products of combustion do not, therefore, exclusively heat any large portion of the oven wall, but are so thoroughly subdivided and the flues which carry

them to the regenerators are so intermixed with the heating flues of the oven that the temperature in every part of the oven wall is said to be absolutely uniform, the draft on all the flues is equal and the walls therefore are not subject to expansion and contraction, but remain permanently tight. The result is that the Collin oven produces a coke of more uniform quality, that the coking time is shortened and the life of the oven itself prolonged. This method of heating is diagrammatically indicated by the bottom diagram, where the shaded portions again indicate those parts of the oven wall heated by live gas and the unshaded portion those parts along which the products of combustion travel.

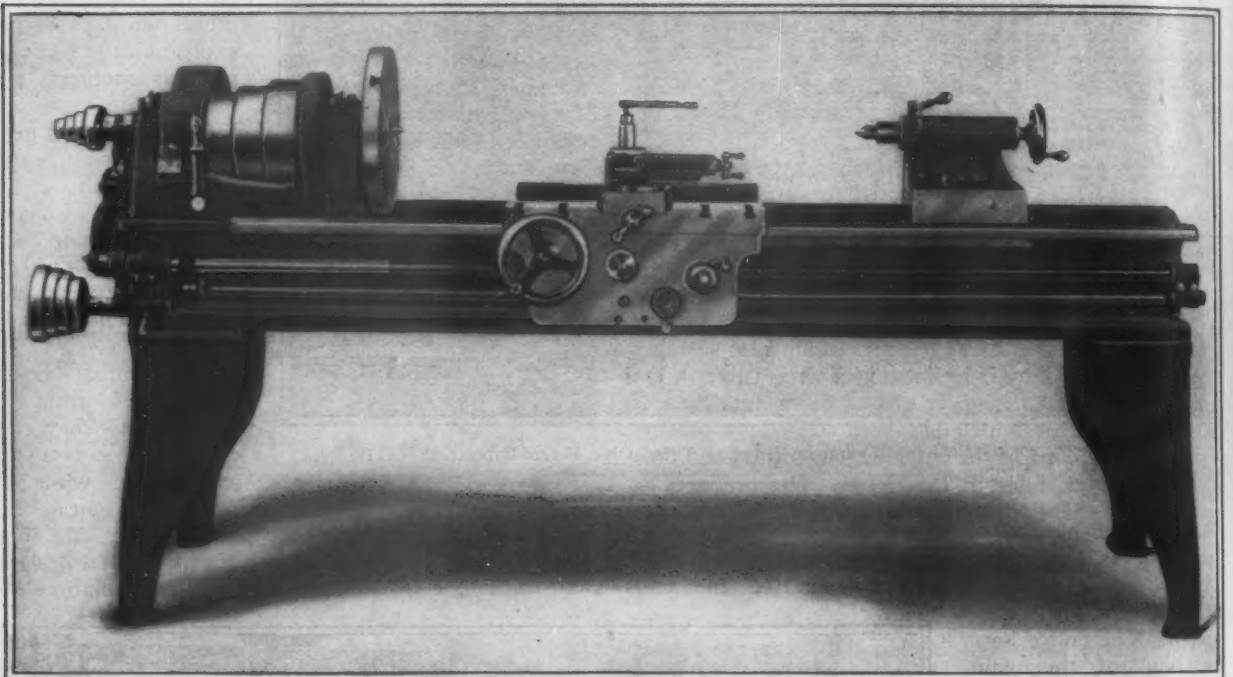
The Miami Valley 16-in. Engine Lathe

A new tool, which has just been brought out by the Miami Valley Machine Tool Company, Dayton, Ohio, is the 16-in. standard engine lathe with double back gears, shown in the accompanying illustration. It is of

lar equipment include a full set of change gears, large and small face plates, follow and steady rests, a double friction countershaft and wrenches.

Western Shippers to Aid the Commerce Commission

A representative committee of Western shippers will take an active part in the proceedings before the Interstate Commerce Commission to determine whether the railroads are justified in making a general advance in freight rates. The committee will not place itself in active opposition to the railroads, but will merely submit statistical data and other evidence which may be of value to the commission in considering the case. This committee is the outgrowth of a conference or convention of shippers which was held at the Congress Hotel, Chicago, May 17, last. A general committee was appointed at that time for the immediate purpose of securing a postponement of any general advance in



The 16-In. Back Geared Engine-Lathe, Built by the Miami Valley Machine Tool Company, Dayton, Ohio.

the same general design as the 15-in. single back gear lathe made by this company, which was illustrated and described in *The Iron Age* March 11, 1909. The headstock is massive and has a long bearing to resist chatter or vibration under heavy cuts. It is driven by a wide three-step cone pulley and this, together with the double back gears, makes the lathe a powerful heavy duty machine. The back gears are shifted by the hand lever on the head stock and have ratios of 5.6 and 9.6 to 1 for the single and double gears, respectively. The tail stock is of the off-set design and will permit using the compound rest at right angles or parallel with the bed.

The carriage is of the T-slot design with a bearing 23½ in. long. It is gibbed both front and back and the cross bridge is heavily ribbed. The cross slide and compound rest are of heavy design and are also well gibbed. The slide for the latter has been lengthened to give a 5-in. feed. Five to 40 threads per inch can be cut, including an 11½ to the inch pipe thread, all of which can be cut without stopping or reversing the lathe. The feeds in both the apron and the head are reversible and it is impossible to engage the screw and the feed rod at the same time. This machine can be used with either belt driven or positive feed and the gear on the feed meshes with either a gear on the cone pulley shaft or a gear on the lead screw. The lathe is equipped either with a compound or plain rest and other accessories furnished as a part of the regu-

rates until the reasonableness of such advance could be considered by the Interstate Commerce Commission.

The preparation of data for the commission is now in charge of a subcommittee of which Frank B. Montgomery, traffic manager of the International Harvester Company, Chicago, is chairman, Mr. Montgomery being also chairman of the Traffic Committee of the Illinois Manufacturers' Association. The other members of this committee are E. J. McVann, Omaha, Neb.; H. G. Wilson, Kansas City; J. C. Lincoln, St. Louis; W. P. Trickett, Minneapolis; E. E. Williamson, Cincinnati, and H. C. Barlow, Chicago. All are actively identified with large shipping interests.

The Jackson & Church Company, Saginaw, Mich., has broken ground for a new boiler shop, 95 x 240 ft., to be of brick and concrete construction. As soon as this building is completed the company will take down its present machine shop, which is of steel construction, 50 x 225 ft., and add 125 ft. to its length and 40 ft. to the width, making a machine shop 90 x 350 ft. Both buildings will be equipped with traveling cranes when completed. It is also the intention of the company to remove and consolidate its two foundries, thus enabling it to do light and heavy work under one roof. The company will do its own structural iron work and erecting.

An Exposition of Bolt, Nut and Forging Machinery

The National Machinery Company to Show New Models

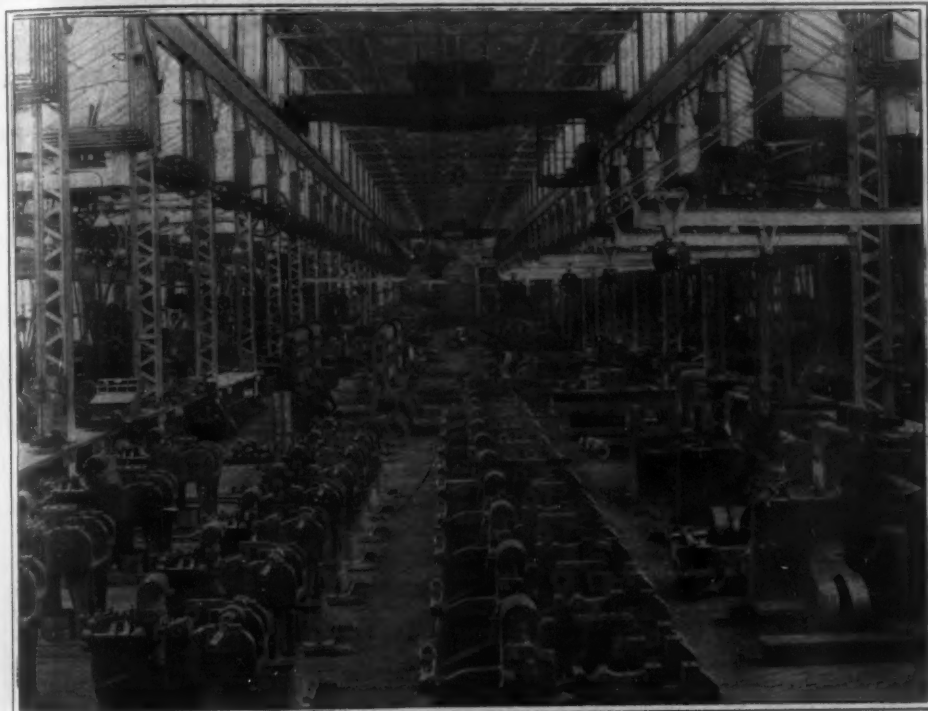
Arrangements have been completed by the National Machinery Company, Tiffin, Ohio, for an exposition of modern bolt, nut and forging machinery, to be held at

to show the National method of motor application. In addition to these machines the company has developed and will exhibit for the first time a number of new designs, the object being to familiarize the trade with them by demonstrating their actual service conditions so far as the shop facilities will permit. Altogether over 50 machines will be shown on the exposition floor and most of these will be in operation.

A number of invitations have been extended to firms and individuals interested and the International Railroad Master Blacksmiths' Association, which will be in convention at Detroit, August 18 to 20, will be conveyed to Tiffin on a special train to attend the exposition on Friday, August 19, which has been set apart as Master Blacksmiths' Day. On the other two days of the exposition the bolt and nut manufacturers, the mechanical heads of the railroads and general industrial representatives will be the guests of the company at the exposition, and special provision has been made for the accommodation of all guests.

The mutual benefit to be derived from exhibits of this character cannot be overestimated, for while it

further the aim of the manufacturer in getting his product before prospective customers, at the same time they keep the user in touch with the very latest designs and methods employed and enable him to improve his



Center Bay in Shop of the National Machinery Company, Tiffin, Ohio, Where Exposition Will Be Held.

its shops on August 19, 22 and 23. Two years ago this company completely remodeled and greatly enlarged its plant, installed a number of electric traveling cranes and adopted electric power for driving the tools throughout the entire plant. The entire lower end of the main shop will be devoted to the exposition, and the accompanying illustrations are two views of the center bay of the shop.

The exhibit includes forging machines, bolt headers, continuous and automatic rivet machines, several types of automatic machines for tapping and boring hot pressed nuts, two of which were illustrated and described in *The Iron Age*, February 4, 1909, and April 28, 1910, respectively; vertical roll threaders for handling bolts and long rods, lag screw gimlet pointers, bolt pointers, shears, die sharpeners and bolt cutters. The four-spindle model of the last was illustrated and described in *The Iron Age*, February 3, 1910. Many of the machines will be directly driven by electric motors



View of Same Bay, Looking in Opposite Direction.

equipment by the adoption of those designs and methods. This will doubtless be of interest to other manufacturers whose products can be thus shown.

The Motsinger Rotary Engine

A Three-Rotor Model Combining Two Engines in One

The single rotary piston engine has, from the invention of the first steam engine, been the ideal of most inventors and mechanical engineers, and perhaps more money has been spent in research work on this type of engine than all the others combined. The Motsinger double rotary engine, built by the Motsinger Rotary Engine Company, Greensburg, Pa., is said to offer a solution of the problem by eliminating the bad features of the reciprocating and turbine engines and retaining all their good points. Fig. 1 shows the engine driving a centrifugal pump, Fig. 2 is a sectional elevation of the

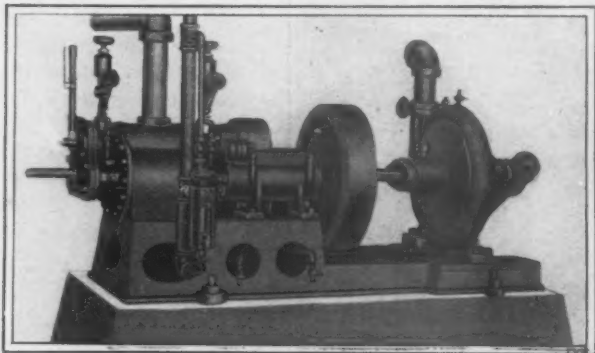


Fig. 1.—The 20-Hp. Rotary Engine, Built by the Motsinger Rotary Engine Company, Greensburg, Pa.

engine, Fig. 3 is a section through the cylinder and Fig. 4 is a section showing the manner of packing which is one of the special features of the engine. These engines can be used for driving all sorts of machinery through a belt connection from the flywheel or by direct connection to the shaft of the driven machine and can operate electric generators or centrifugal pumps.

The Cylinder

The engine comprises a cylinder *d* having three bores, whose axes are in the same plane. Three rotors, *e*, *f* and *g* (Fig. 3), are mounted in these bores, the central rotor being formed with a longitudinal groove *h* and the side ones having a longitudinal vane *i*, the radii of the outside bores being greater than the radius of the middle bore by the height of this vane, and these outside bores cut into the middle one a depth equal to the difference of their radii. A fourth

bore is found directly above the center rotor, and a hollow cylindrical reversing valve *a*, is mounted therein and extends at each end into the heads *j* and *k*.

The cylinder also is formed with a steam space *l* (Fig. 2), surrounding the rotors to equalize the heat expansion of the cylinder to the rotors. An inlet *m*, at the bottom of the cylinder admits steam from the boiler to this steam space, and an outlet *n*, at the opposite side of the cylinder leads the live steam into either end of the reversing valve and out at exhaust pipe *o*. The complete cylinder is covered with asbestos and sheet iron jacket to prevent radiation.

Both cylinder heads are exactly alike, being cast from the same pattern. They are of a form corresponding to the cylinder to which they are secured at each end facing each other. Each head is formed with bores for the shafts *p*, *q* and *r*, and a bore to receive the reversing valve. Three ports lead from this last bore to and from the engines—two exhaust ports *b* and *c*, which are alternately closed at either end by the reverse valve in reversing the engine and one common inlet chamber, *s*, in front of the cut-off plates. This port is only open to live steam when the exhaust ports are closed. Around the center shaft the head is counterbored to receive a stationary plate containing two ports, one port communicating with one engine through port *t*, and the other with the other engine through port *u*.

Over these two ports revolves a cut-off plate *nn* secured by a collar to the center shaft. It has but one port, and as it revolves, steam is cut off for each engine as desired, and allowed to expand the rest of the cycle. In the heads are cored two shoe-shaped ports *t* and *u*, which lead directly into the expansion chambers behind the vanes of the outside rotors. They are diametrically opposite to each other, and since the heads are placed facing each other on the cylinder, these ports will always stand diametrically opposite each other but reversed in position. Hence, it is only necessary to reverse the steam from one end of the cylinder to the other, by the reversing valve to reverse the engine.

Over the chamber containing the cut-off plates is fitted an end plate *j* through which the reverse valve is fitted and a portion *v* is flanged and notched to secure the pawl *w* of the valve handle *x*. A similar head plate is formed by the end of the gear case *y* for the opposite head of the engine.

The Reversing Valve

The reversing valve *a* is a hollow cylinder extending from end to end of the engine through the cylinder

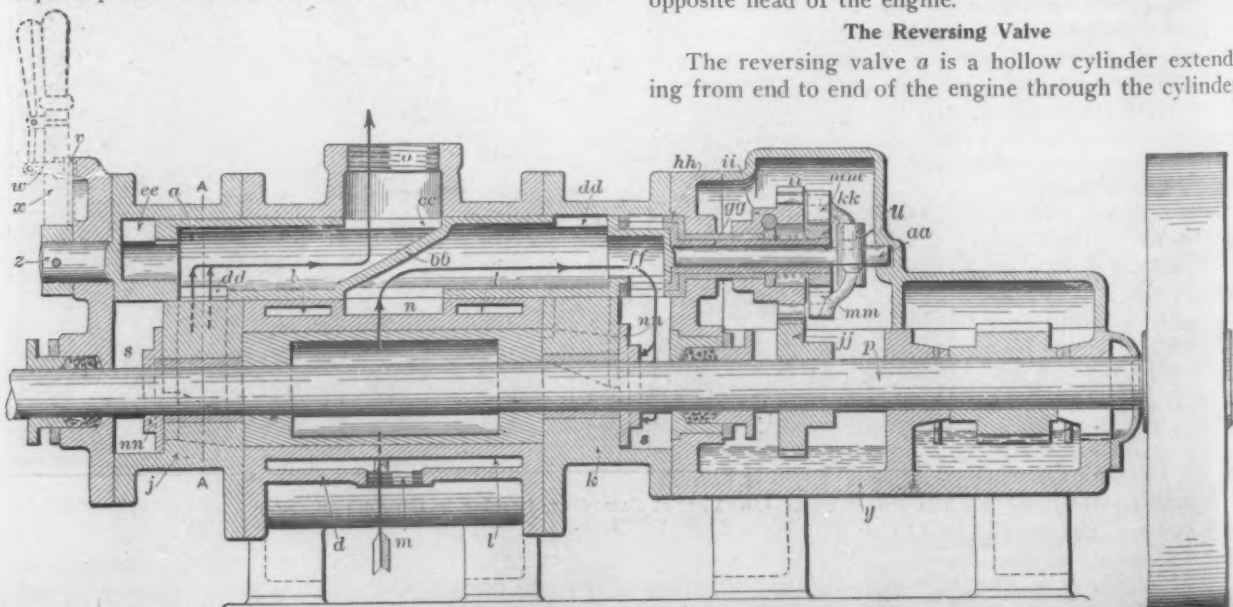


Fig. 2.—Sectional Elevation of the Engine.

and the heads to communicate with the several steam chambers and ports. At the head end it is formed with a journal z projecting through the end plate j , on which is mounted a lever for turning it, which carries a common form of securing pawl adapted to engage in notches in flange on the face plate to secure the valve in the adjustment desired.

On the opposite end this valve is formed with a shaft, a , extending into a bearing formed in the inner face of top of the gear case y . The valve is divided into two chambers by a central diagonal partition, b , being formed with a center port on one side of said partition and another center port, c , on the opposite side, both of which are adapted to communicate with

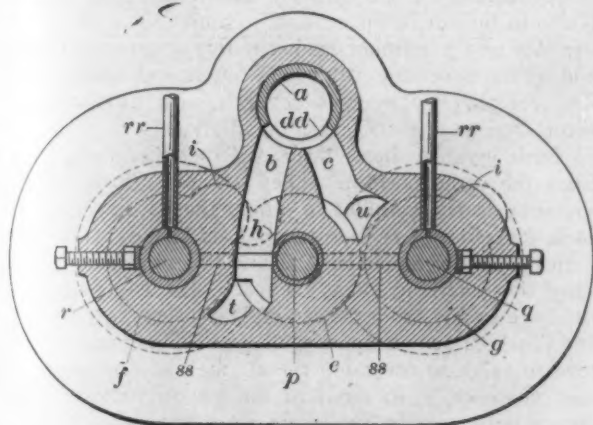


Fig. 3.—Section Through Cylinder Along A A.

the live steam outlet n , from the steam space l , and with the exhaust outlet o in the cylinder d , according to the position of the valve. The exhaust pipe of the engine is connected with the exhaust outlet of the cylinder. Near each end but on opposite sides of the valve are formed ports, d , which, when the parts are in the position shown in Fig. 2, one will open the exhaust ports b and c (Fig. 3) in the head j to the air, while similar exhaust ports are closed in the head k . On the opposite side and nearer the end of the head j it is formed with a port e , adapted to communicate, when in the proper position, directly with the inlet steam chamber s in the head. Its extreme end in head k is reduced in diameter to receive the governor sleeves, and a port, f , therein communicates with the inlet steam chamber.

The Governor

The governor comprises a sleeve, g , mounted around the end of the reversing valve, and a second sleeve, h , mounted outside the first one. This outer sleeve carries a gear wheel i , which meshes with a second gear wheel, j , on the shaft of the center rotor. The inner sleeve g extends through the outer sleeve h beyond the outer face of the gear wheel mounted thereon and carries a pinion, k . The gear i is provided with stud shafts on two diametrically opposite sides of its axes on each of which is mounted a weighted governor arm l , the hubs of which are formed with teathed segments, m , on their adjacent edges, which are adapted to mesh with pinion k . A coiled spring connects the outer ends of these weighted arms to hold them normally toward each other. A second spring is coiled around the sleeve g in a chamber in the hub of the wheel i . One end of this spring is connected with the pinion k and the other end to a worm wheel mounted on sleeve g and engaging with a worm, by which it may be turned to regulate the tension of the spring as desired.

These springs can be used together or one may act as a substitute for the other. Two ports in both sleeves, g and h , are adapted to register with port f in the reversing valve. Thus the steam is not only cut off as desired by the ports revolving over the port

in the reversing valve, but the size of the ports is constantly varied to suit the load by the centrifugal movement of the weighted arms, thus making what is said to be the most perfect of automatic cut-off governors.

The several rotor shafts extend through the gear case and are journaled in bearings provided with bronze bushings and oil rings in its ends and in the partition at the right end (Fig. 2). They are geared together by strong cut steel gears, which are pinned on the respective shafts, and run in oil, and the shaft of the center rotor extends to the outside and is provided with a fly wheel, by which power is transmitted from the engine.

Packing the Engine

Much of the power and economy of any engine using steam expansively depends upon tight fitting and durable packing, which is one of the special features of this engine. The method followed, which is described at length further on, is said to be very efficient, and the longer the surfaces of the rotors roll upon each other the smoother they get, and the tighter the fit. Fig. 4 shows the method of packing the ends of the rotors as well as the tops of the vanes.

Each side rotor is formed with a recess in its ends, in which is mounted a steam packing ring secured on splines, o , and normally held outward against the heads by the coiled springs p . Radial grooves are formed in the rings, in which are mounted packing strips, which are normally held outward by the coil springs q . The vanes l are also formed with longitudinal grooves in which longitudinal packing strips are mounted. Both grooves and the packing strips are T-shaped, the wide portion being at the bottom of the groove to hold the strip in place. These strips are planed off to fit the bores they are to travel in, and three or four coiled springs are inserted beneath them which, with the centrifugal force of rotation, hold them steam tight against the wearing surfaces and take up the wear. The middle rotor is packed in the

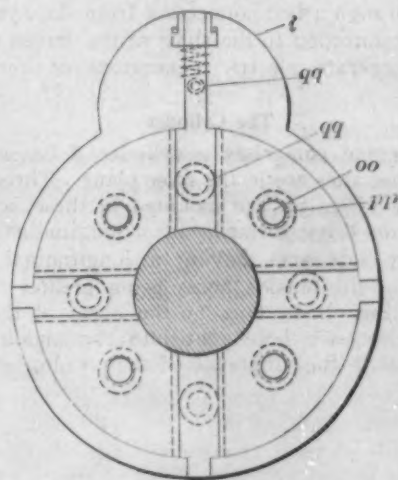


Fig. 4.—Section Showing Method of Packing.

same way by the use of four longitudinal packing strips, one set on each side of the groove, and all four are 90 degrees apart, so that two of them (one above and one below) are doing service all the time in keeping the steam from passing from one engine to the other. But a few thousandths of an inch play is given beneath all these packing strips, and the corners of the cylinder, where the bores cut into each other are rounded so as to allow them to glide smoothly in and out of service in rotation. As soon as they wear to a polished surface they become very hard and cease to wear and scraping the oil before them, make the engine almost as tight as a bottle.

The ends of the middle rotor are packed with four radial packing strips set in a packing ring similar to the ones used in the side rotors.

The shafts of the outside rotors, Fig. 3, are journaled on bearings which are lined with split bushings, which are sawed to form a flexible tongue in the middle about three-fourths of their length. The flexible parts are held by spring gibs, under tension of adjusting screws, against the shafts for the purpose of keeping the side rotors steam tight against the center rotor, and to compensate for any wear that may take place in the bearings. These set screws should not be touched more than once or twice per year, as high-grade phosphor bronze bushings are used on the long bearings and the wear is very little. The center rotor having almost equal lateral steam pressure, and being closely held by the contact of the side rotors, needs no lateral adjustment and will run for years if properly oiled.

The cylinder of the engine is oiled by any good sight or force feed lubricator. All three bearings in each head are well oiled by a single lubricating cup attached to the oil pipes, *r r*, Fig. 3, which lead to each side rotor bearing. From these bearings oil holes, *s s*, lead to the center bearing. These bearings also get some oil from the cylinder lubrication.

It will readily be seen that, although this engine takes steam twice per revolution as a unit, each separate engine takes steam but once per revolution, and exhausts but once, and continued steam pressure is obtained during almost a complete revolution. With cut-offs set at the same point of stroke twice the expansion of the ordinary reciprocating engine or the equal of a compound engine is said to be obtained without the trouble of compounding the cylinders which makes the engine the equal of a quadruple expansion engine.

There are several ways these engines may be compounded. Three of these are:

1. By setting the high pressure cylinder on top of the low pressure cylinder, and gearing the center shafts of the two engines together, which will require a set of gears for each engine and a pair of gears connecting the center shafts; 2, by setting the high and low pressure cylinders tandem—the low pressure cylinder being larger in diameter as well as longer—and directly connecting the center shafts of both engines which will require two sets of gears—one for each engine; 3, by setting the high and low pressure cylinders tandem—both cylinders being of the same diameters, the low pressure being made longer to receive the expanded steam, when only one set of gears are needed, since both the high and the low pressure rotors may be placed on the same shafts, the middle head being split horizontally to permit assembling. Compounded in any of these ways, the engine can be run compound or simple forward, or simple backward. It will occupy as little space as the turbine, and used with a condenser ought to prove most economical, as the steam will be used expansively against close fitting rotors for almost two turns, and is cut-off completely twice. There being no dead points, the power will be steady and the steam exhausted at almost atmospheric pressure.

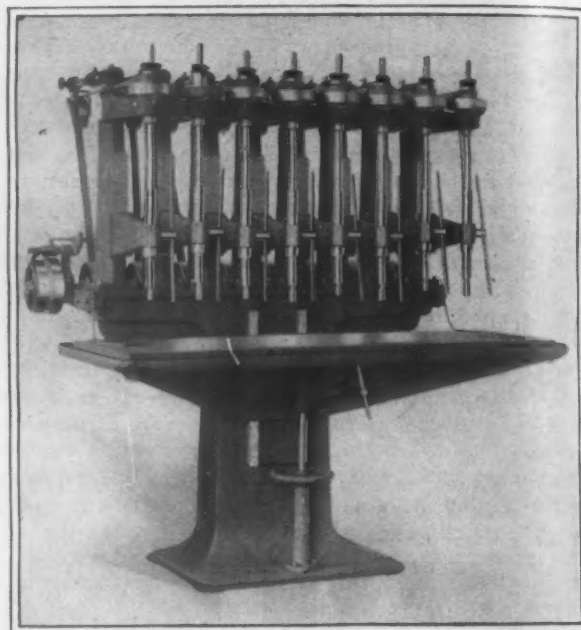
Five sizes of engine, ranging from 5 to 80 hp., are regularly built, but the maker can supply larger sizes of simple engine under special contract or compound engines for large electric light and power purposes. In the engine described the rotors run at the same speed, but the maker has developed a new type in which the ratio between the outside rotors and the middle one is 2 to 1.

The Chicago, Rock Island & Pacific Railway Company has leased the real estate and plant of the Blue Island Rolling Mill & Car Company at Blue Island, Ill., for three months, with the privilege of buying the property prior to October 31. The lease was entered into July 15 and was signed by F. H. Niles, president of the Blue Island Company.

The Henry & Wright Eight-Spindle Drill

A new line of ball-bearing drilling machines has been brought out by the Henry & Wright Mfg. Company, 111 Sheldon street, Hartford, Conn., and is illustrated herewith. The special features of this new model are a wider, heavier and better balanced base, a wider tableway, a much heavier table with oil grooves twice as wide and deep as formerly, a new design of idler pulley and belt guide for adjusting it, a new dust-proof thrust bearing and a new weight chain.

Like the drill which was illustrated and described in *The Iron Age*, July 4, 1907, these machines are built



The Ball-bearing Eight-Spindle Sensitive Drill, Made by the Henry & Wright Mfg. Company, Hartford, Conn.

in from one to eight spindle sizes, the latter being the one illustrated, and have the distances from the spindle centers to the face of the column so arranged as to be able to drill to the center of 14, 19, 24 and 30 in. circles, respectively. Another point of difference between the 1910 model and the one previously described is that while in the latter the table was made in two parts, the table with the new model is in one piece and is elevated and lowered in a different way. In the older model telescopic screws operated from a handle at the front of the table were employed. In this model the hand wheel underneath the table controls its vertical motion through a screw and the handle at the right of the screw serves to clamp the table rigidly at the desired height.

The Power Specialty Company, 111 Broadway, New York, is just completing at its works in Dansville, N. Y., a modern foundry 100 x 140 ft., with electric traveling cranes, industrial railroad, core ovens and core machinery, molding machines, &c.; in fact, a complete equipment, which has been made necessary by the growth of business in Foster superheaters and Heenan refuse destructors. The building is of steel frame structure, brick filled above the line of the window sills, which are of molded concrete extending all round the building. A novel feature is the use of electrical conduit seconds, 13 in. square, for the walls between the concrete foundations and the concrete window sills. This proves a very substantial form of construction and is quickly laid. The company has received orders the past month for superheaters from a large number of localities in nine different States and in Canada, and for a 60-ton refuse destructor from Montgomery, Ala.

The Economy Oil Cup

On September 28, 1909, United States letters patent were granted to Eugene M. Crozier, Augusta, Ga., covering a removable lubricating device having a felt base and described as a bearing lubricator. This invention was the result of two years' diligent experiment by Mr. Crozier to perfect an oiling device for lubricating bearings of street railway cars that would eliminate the old and inefficient system of filling the grease box with waste and permitting the oil to pass through it into the bearing slot. The engravings show the form in which the invention now known as the Economy oil cup has been placed on the market by the Economy Oil Cup Company, Montgomery Building, Augusta, Ga. Fig. 1 shows a bearing equipped with this device, and Fig. 2 illustrates the manner in which the cup is placed in a bushing.

The body of the cup is composed of block tin, shaped to fit the grease box, and made in various sizes to conform to the different styles of motors. The felt base fits the bearing slot and rests upon the shaft to which it conveys the oil direct. The weight of the cup causes it to follow the shaft as the felt wears, assuring a free and uniform feed of oil at all times. The base is composed of one piece of sheet felt that extends up into the body of the cup. All oil passes through this base direct to the shaft, which, it is said, prevents dirt, grit or dust from entering the bearing. There is no drip from the bearing when the cars are standing in barn or stations along the road, as the cup feeds oil only when the shaft is in motion. The oil does not leave the cup until the shaft is reached and cannot leak out around loose bearings, as the cup rides the shaft at all times with felt base below the top of bearing slot. The removable feature of this cup permits inspection of bearing at all times by simply lifting the grease box lid. An oiling of $\frac{1}{2}$ gill per bearing will furnish perfect lubrication for 37 hours' service or from 275 to 300 miles.

In use these cups are said to fulfill all expectations and have greatly reduced the cost of lubrication. During the month of April, 1908, the cost of lubricating the cars on the Aiken division of the Augusta Railway Company, which was in charge of the inventor, was

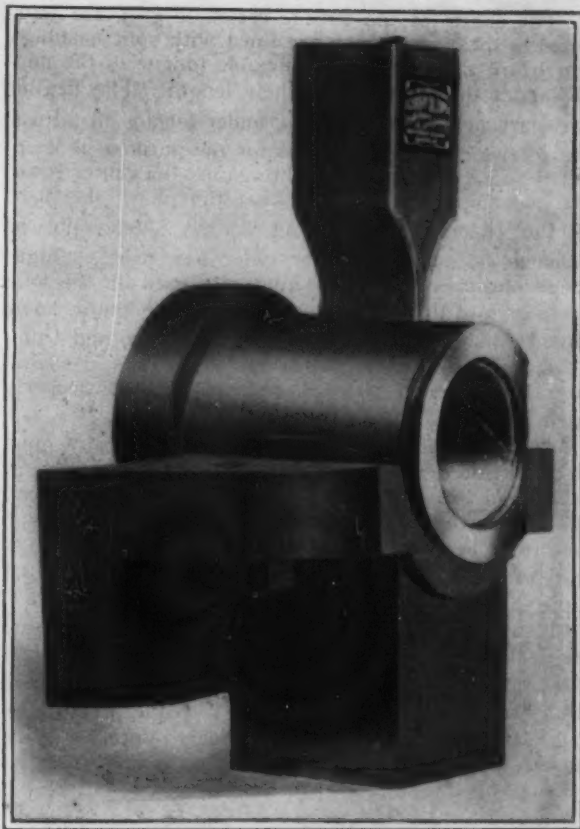


Fig. 2.—The Economy Oil Cup in Place in a Bushing.

\$1.14 per 1000 car miles. Sample cups were placed on a number of trial cars the following month, and by the end of June, 1908, the cost of lubricating had been reduced to about 70 cents per 1000 car miles, with less than one-third of the cars in service on this division using the cup. At the present time the entire division is equipped with the Economy oil cup, with the result that the cost of lubrication has been reduced until the net cost now is 18 cents per 1000 car miles, and the condition of the armatures and bearings is said to be the best in the history of the road.

The Columbus Garbage Disposal Plant

The new municipal garbage disposal plant, built by the city of Columbus, Ohio, was started in operation July 21. The plant has a capacity of 80 tons of garbage per day. The entire equipment, including all the machinery, is working without a hitch, and it is generally considered by those who have inspected it that it is the most modern and up to date garbage plant in the world.

The buildings were erected at a cost approximating \$100,000. In addition to this the complete equipment approximated \$150,000, including elevating and conveying machinery, the latter being designed and built by the Jeffrey Mfg. Company, Columbus. The construction of this equipment will save the city thousands of dollars. The products consisting of fertilizer, oil, &c., will be sold; the proceeds, it is thought, will pay for the cost of operating. Notwithstanding the enormous amount of material to be handled and the extensiveness of the operations of this plant, only 20 men will be required when it is running at its greatest capacity.

The J. F. Lucey Company of Los Angeles, Cal., a large jobber of oil well tools and supplies, having stores and warehouses throughout all the Western oil fields, has opened an office at 960 Monadnock Building, Chicago, for the purpose of purchasing supplies and handling its foreign business.

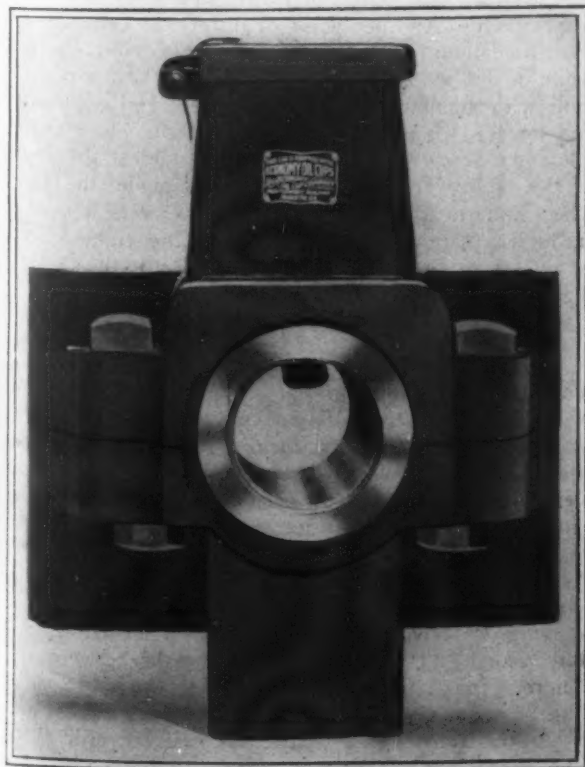


Fig. 1.—Bearing Equipped with the Economy Oil Cup, Made by the Economy Oil Cup Company, Augusta, Ga.

Modern Gas Producers

Interesting Features of Types Developed by European Engineers

[Chief Engineer J. Hofman of Witkowitz contributed an elaborate paper on gas producers for the recent Duesseldorf International Congress of Metallurgy. Passing over the historical matter contained in the paper, some of the latest achievements in this direction will be of interest.]

A very marked advance was attained by the invention of the Kerpely producer with rotating grate. It was first installed at the Donawitz Works, and since that time some 350 producers of this type have been placed in daily service. It is a very capacious apparatus and turns out large quantities of gas. Fig. 1 shows the construction plainly. The grate is built up on the inner edge of the pan. The lower portion of the shell is arranged for water cooling, and to this is attached a cast iron ring or cylinder, dropping down into the pan and forming the water seal. Air, moistened with steam, is furnished by a fan, and is introduced below the grate

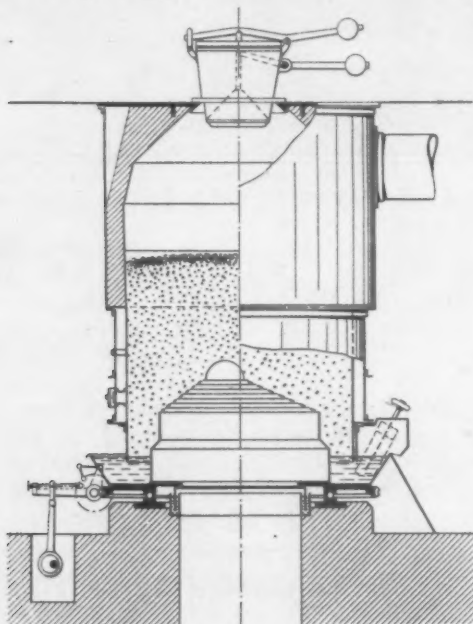


Fig. 1.—Kerpely Gas Producer with Rotating Grate.

which extends upward into the portion of the producer provided with the water cooling. The pan with the grate attached is rotated continuously by means of a motor, and any slag formed gets between the iron ring and the grates, which are placed eccentric with respect to the producer, and thus it is crushed and drops into the pan in small lumps.

The special characteristics of this producer are the water cooled lower shell, the slowly rotating eccentric grate, and the mechanical removal of the ash, no manual labor being necessary for purposes of cleaning. These producers are made with a diameter in the clear of from 7 to 10 ft., and gasify from 10 to 24 tons of anthracite per 24 hours, or from 22 to 33 tons of soft coal for the same time, depending upon the diameter of the apparatus. Even if forced the producer works well, giving a steady supply of gas, while the ash is clean, and as the rate of gasifying is good and a minimum of labor is required, the producer may be considered a good and economical one.

It is only natural that this producer, originally intended for soft coals, should undergo considerable modification, especially in the grates, when handling hard coals. Hence a number of types have been developed from the original Kerpely system. The one best known is by Rehmann, and is shown in Fig. 2. The grate here consists of several sets of perforated super-

posed cones. In consequence of the several points thus projecting into the incandescent fuel, this will not churn, and the ash has to slide down the conical surfaces. Moreover, the residues are loosened up somewhat, even before reaching the cones, by reason of the revolving points. The air passages being covered are

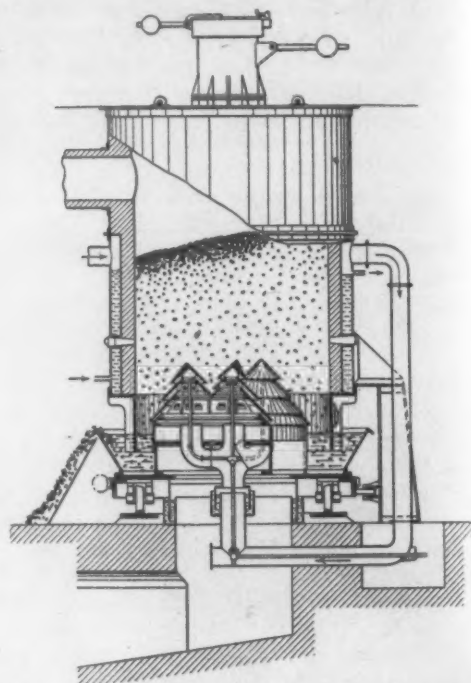


Fig. 2.—Rehmann Gas Producer with Rotating Grate.

not clogged up, and as each set of cones has its own supply of steam laden air, the working of the producer stronger at either sides or center can be readily regulated. The lower portion of the apparatus consists of cast iron segments which may be removed at will, so that it is possible to take out some of the grate bars for replacement without emptying the producer. The pan revolves on wheels and not on balls, as in the case of the Kerpely producer, and this is said to prevent occasional stoppages. The deflector plate taking the ash from the pan automatically may be set high or

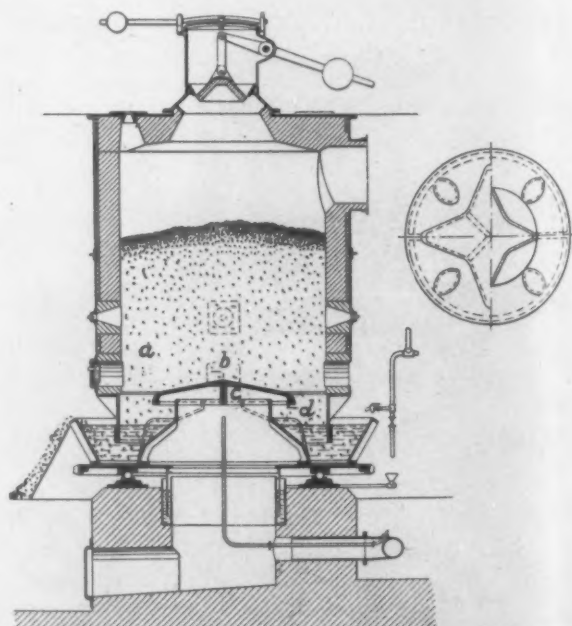


Fig. 3.—Hilger Gas Producer with Rotating Grate.

low and thus removes the desired amount. Iron prongs are set behind this plate to catch and remove lumps of slag that may have been formed.

Another interesting modification is the Hilger producer. This is shown in Fig. 3. Here also the grate is the important point, and consists of an underframe cov-

ered by a peculiarly constructed bonnet. Between the two there is left a star-shaped aperture, opening downward, through which the steam and air mixture is let in. The grate is very low, and the projecting points catch the slag and compel the whole material at that point to rotate with the grate. Reinforcements on the grate facilitate this action.

The very latest, however, is the so-called S. F. H. producer, built by Fichet & Heurtey of Paris, in which the slag is tapped out in a molten condition. It is a revival of the Ebmelmen idea of two generations ago; namely, that fuel should be gasified in a regular shaft furnace. After many tests a satisfactory construction was attained in the summer of 1907, since which time this type of producer has proved its value. Fig. 4 shows a section of this producer. It is very similar to a small charcoal furnace, and consists of a continuous shell lined with refractory material. Provision is made for two tap holes to drain the liquid slag from the crucible of the shaft. Three to six water cooled tuyeres are used, and the shaft may have a hearth or not, as desired. A double bell hopper provides for charging and seals the top. A positive blower furnishes the air with pressures up to 10 lb. The proportions of the producer are adapted to the quality of the coal to be gasified. No steam is used.

The operation is as follows: Additions of limestone, sand or granulated blast furnace slag are made to the fuel in order to let the slag come out thinly fluid. The air forced in burns the coal to carbonic acid, which, passing through the heavy bed of fuel above, is almost completely converted to carbonic oxide. Slag is tapped off every hour or two. The temperature at the tuyeres is naturally a very high one. An interesting fact is that with oxide of iron in the ash of a coal or in the additions, this is reduced and runs off as pig iron with the slag, just as in the blast furnace. An analysis of the gas obtained with this type of producer is as follows:

| | Soft coal. | Hard coal. | Lignite. |
|-----------------------|------------|------------|----------|
| CO | 28.3 | 31.0 | 29.5 |
| H | 7.7 | 6.0 | 6.7 |
| CH ₄ | 7.5 | 6.5 | 3.2 |
| CO ₂ | 1.4 | 1.0 | 2.5 |
| N | 55.1 | 55.0 | 58.1 |

The bosh of the furnace is renewed every three months; the lining above lasts several years. At Gironcourt six of these producers have been working for three years using fuel with the ash content 37.44, carbon 44.41 and water 10. The advantages of the S. F. H. system seem to be the small first cost; low maintenance expense, having no complicated grates; the making of dry gas, not requiring steam; the use of high blast pressure, which gasifies dusty and low grade fuels; and finally, low operating cost.

Gas Producer Practice at Witkowitz

Mr. Hofman concludes his interesting paper with a few general remarks on the subject of running gas producers. Ever since 1879 the Witkowitz Works have used limestone additions to the fuel in their gas making practice. It seems that the distribution of this material keeps the coking of the coal in better shape, prevents great clinkers and prevents those which do form from sticking to the walls of the producer. Furthermore, the driving off of the carbonic acid gas from the limestone, with the subsequent change to carbonic oxide, increases the output of gas. In his opinion the formation of the proper slag in the gas producer is just as important as it is in the blast furnace, for there are very few fuels which will run themselves without attention when handled by the rotating grate type of producer, where the slag or clinkers must be friable.

A further important point is the quality of the steam blown into the air. This is seldom as dry as it should be, on account of the distance of the boilers from the gas plant. As a consequence, there is too great a proportion of water introduced with cooling

effects in the producer rendering the formation of carbonic oxide incomplete. The presence of 13 grains of water in the cubic foot of producer gas is fatal in the making of quality steel in the open hearth furnace. It is therefore advisable to superheat the steam before allowing it to mingle with the air in the producer as this is blown in. As an example of the value of this practice, it may be stated that of two producers running side by side, of identical make and construction, one using plain steam and the other receiving it superheated, the former always gave the poorer gas as well as gasified less fuel.

The importance of the new development of the producer industry cannot be overestimated in connection with the use of poor grade fuels. With high pressure blast it is possible to use up the immense breeze piles of coke economically; indeed, one large works in Europe is now about doing this. Furthermore, in winning coal, it will not be necessary to reject the poorer grades as absolutely unfit for the market, and hence slaty fuels need not be thrown away where they cannot be washed clean enough ordinarily. The application of

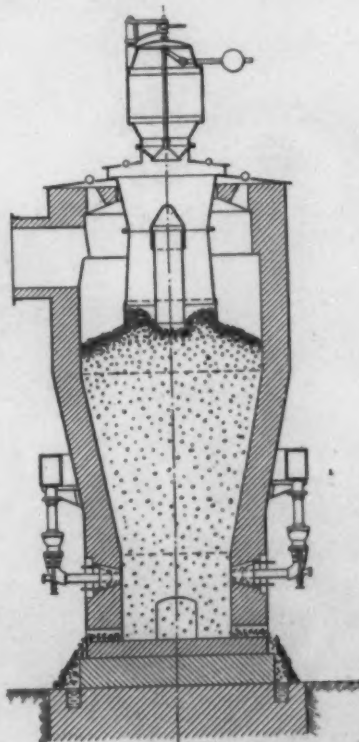


Fig. 4.—S. F. H. Gas Producer of Fichet and Heurtey.

gas thus made under boilers is self-evident, and when it is considered that fuels with 65 per cent. ash, 20 per cent. carbon and 15 per cent. volatile matter are regularly used at the works of Comp. des Mines Blanzey in Montceau des Mines, for all purposes through the gas made from them, the field for utilizing waste material has been widely extended and so far as waste fuels are concerned this problem has been practically solved. Time will show a great development of producers along the shaft furnace type, and the natural outcome will be the erection of central stations for generating current for long distance transmission.

The copper statistics issued by Henry R. Merton & Co., Ltd., London, show that stocks of copper in England and France are continuing the decline which has been in progress since February. In that month the stocks attained the high point, reaching a total of 113,455 gross tons. Each month since then has shown a decline of 1500 to 2000 tons. The stocks July 15 were 102,659 tons. On September 30, 1907, the lowest stocks in years were held, the total then being only 12,138 tons.

A Large Newton Milling Machine

Details of a Heavy Type 50-In. Horizontal Model

The accompanying illustrations show a heavy type 50-in. horizontal milling machine built by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., which, while of massive proportions, maintains the fine details for accuracy, economical operation and convenience, both in operation and adjustment, of the smaller and lighter machines. A number of these machines have been built by the maker and are in satisfactory operation on locomotive rod work.

The design and general construction is shown in the engravings, of which Fig. 1 is a view of the operating side and Fig. 2 shows the driving side. The diameter of the spindle in the parallel bearings is 7 in., and

are contained within the saddle and no vibration is transmitted to the cut. The drive to the spindle is further through bevel and spur gears connecting with a General Electric 62-hp. 220-volt intermittent motor having a speed range of 560 to 1120 rev. per min., which gives the spindle a range of 15.55 to 31.11 rev. per min.

The feed is taken from the vertical driving shaft through the operating side of the machine shown in Fig. 1, where three changes of gear feed, namely, 0.10, 0.15 and 0.20 in. per revolution of spindle are provided. The fast power traverse is reversed by a friction clutch engaging the double train of bevel friction clutch gears provided. The lever A engages the clutch controlling the fast traverse of the table and the direction of movement indicates the direction of travel to the table. The lever B engages the clutch for the transmission of feeds, the trip for which is located at C. The hand wheel D is for the hand movement of the table, and

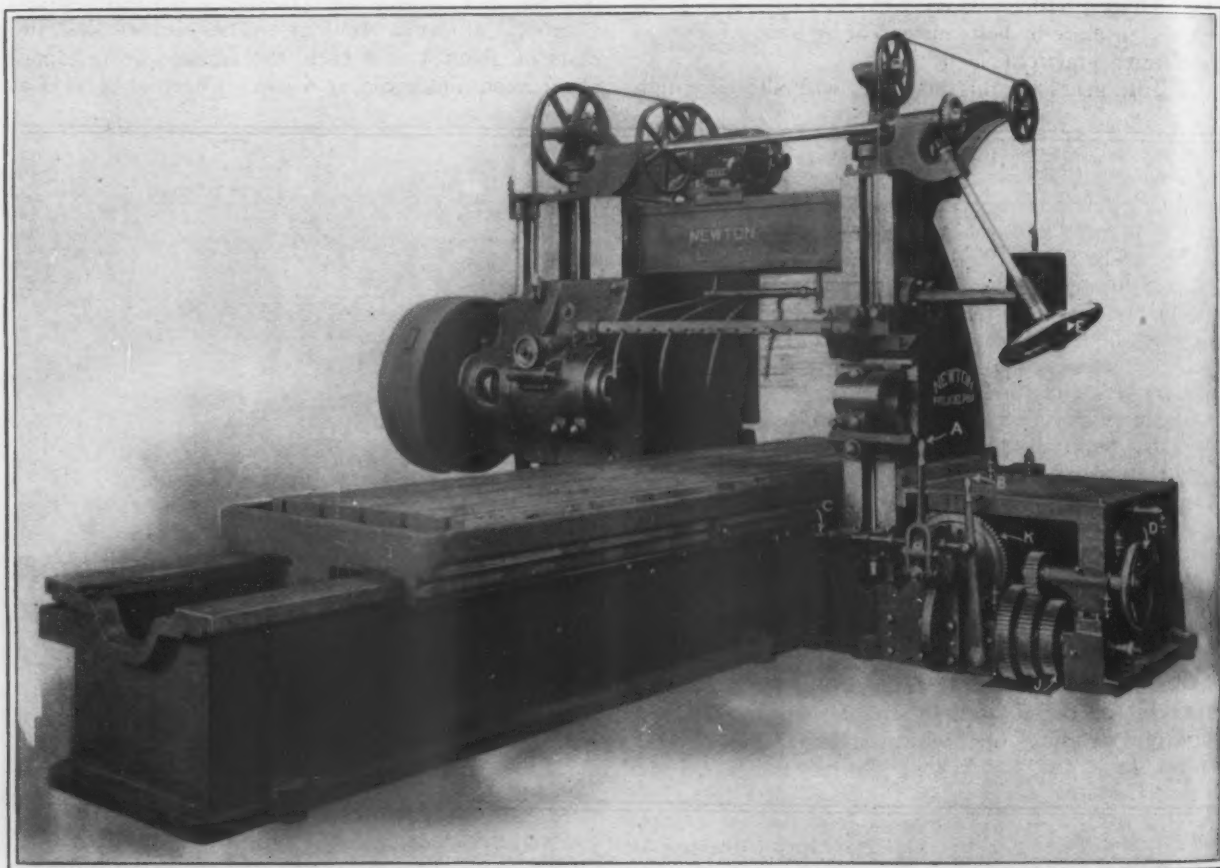


Fig. 1.—Operating Side of a 50-In. Horizontal Miller, Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

in addition there is a double taper bearing in front of the spindle sleeve, whose largest diameter is 11 in. The spindle sleeve is 13½ in. in diameter and has a 10-in. independent hand adjustment. The maximum distance between spindle saddle and the outboard bearing is 51 in., the minimum distance from the center of the spindle to the top of the work table is 5 in., and the maximum 31 in. The work table is 42 in. wide, 14 ft. long and entirely surrounded by an oil pan. The bed is 21 ft. long and 38 in. over the shears, the spindle saddle having a bearing on the main upright 24 in. wide and 45 in. long.

The spindle is arranged to drive a 4-in. cutter arbor by a broad face key. The spindle is fitted with a No. 7 Morse taper and has a through retaining bolt to hold the arbors in place, thus relieving the outboard bearing of all strain when taking cuts. The spindle is driven by a sleeve worm wheel 35½ in. outside diameter, the drive being transmitted by a double keyway. The worm wheel has a bronze ring with teeth of steep lead and the driving worm is of hardened steel with roller thrust bearings. Both bearings are cast solid with the spindle saddle and in this manner all stresses

the hand wheel E for the simultaneous adjustment of the spindle saddle and the outboard bearing, which can also be elevated or lowered by the independent General Electric 3-hp. series wound, 220-volt motor having a speed of 1425 rev. per min., which is mounted on top of the machine and moves the saddle at the rate of 6 ft. per minute.

The spindle saddle is counterweighted and has square lock gibbed bearings on the upright, adjustments being made by the taper shoes F, Fig. 2, which are arranged to permit of easy detachment of the saddle should any accident occur, and also to have the tension on the solid surface. The elevating screws for both the saddle and outboard bearing have a top and bottom bearing to maintain them in alignment at all times. The adjustment of the spindle sleeve is controlled by the worm and worm wheel at G, which govern the movement of the rack pinion engaging into the spindle sleeve. The outboard bearing has an independent horizontal adjustment in its saddle of 8 in. The work table is of very heavy construction and has spiral gear and rack drive with three changes of feed for each of the spindle speeds. The work table and bed are both fitted

with the customary lubricating system, the drip pan being cast solid with the bed.

This type of machine, the maker states, has been attempted before, but never has a machine of such massive proportions with the details incorporated been built. The vertical driving spline shaft, for instance, at H slides through bushings to which it is keyed, causing their rotation in unison, which lengthens the life of the bearing by preventing the escape of oil that would occur should the spline shaft rotate in the fixed bearings. At I the bevel driving gear on the vertical shaft is placed above the driving bevel gear on the horizontal shaft in order that the thrust on the bottom bearing may be equalized by the pressure on the gear, and thus eliminate excessive wear. On the thrust washers placed at the bottom of the shaft, and in the pull pin feed gears J, bronze centers have been placed to facilitate renewals, if necessary, at a slight cost and to overcome the objection of having a loose steel gear revolving on a steel shaft. The male friction clutch K is equipped with applewood blocks thoroughly fitted and held in place by bolts instead of by glue, which was the former practice.

All the gears on this machine, with the exception

the depth and width of cut. For ordinary slab milling the correct output of machines appears, from the maker's experience, to be about 1 cu. in. of metal per minute per horsepower. In conformity with this policy it is the custom of the builder to recommend the size of motor deemed best suited for particular requirements, and in many cases it is necessary to make special modifications in the motor, as it is frequently found that the motors offered cannot possibly develop the power necessary to take the cuts of which many machines are capable.

The machine described occupies a total floor space of 15 x 21 ft., and weighs about 38,000 lb. net.

Electric Pig Iron Production in California

A party of 20, including representatives of a number of San Francisco iron working industries and of banking interests, visited the plant of the Noble Electric Steel Company at Heroult-on-the-Pitt, Shasta County, California, July 21. The visitors saw two casts of about 5 tons each, the furnace being tapped about noon and again at 6 p.m. Charcoal is used as

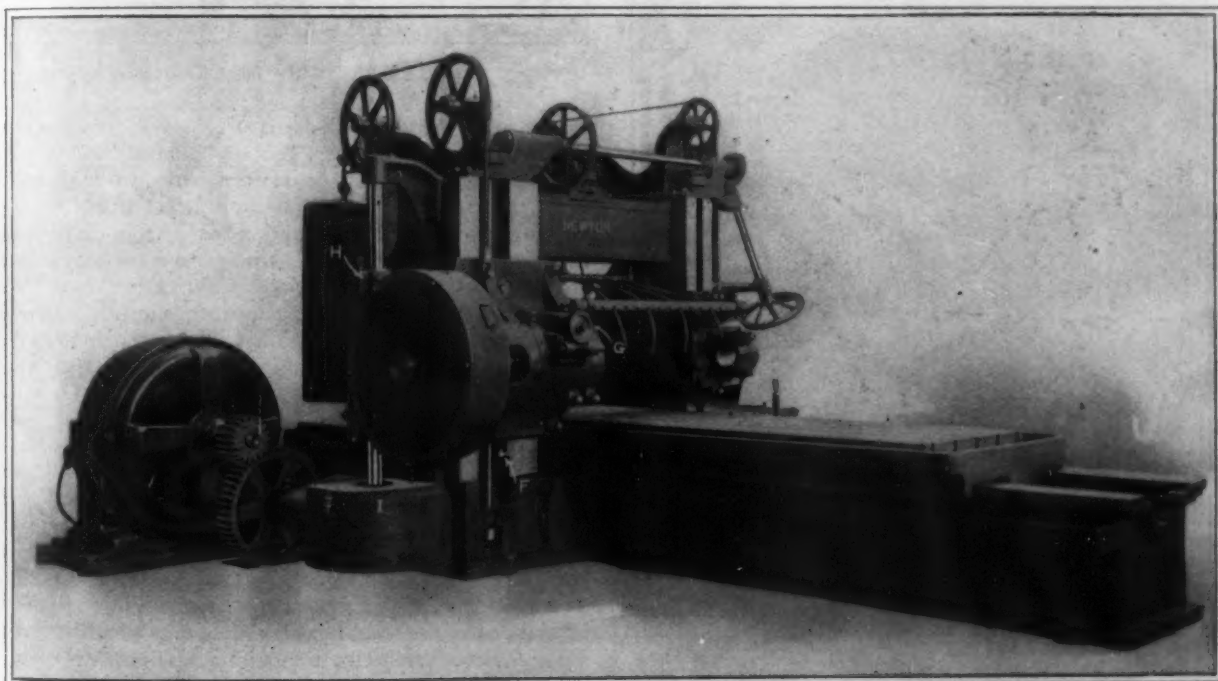


Fig. 2.—Driving Side of the Milling Machine.

of the worm wheel by which the fast traverse is obtained, are of hammered steel with the teeth cut from the solid. This worm wheel is of Tobin bronze.

Data concerning the output of these machines is as yet unavailable, on account of the short time they have been in operation, but it is stated that on the old design of machine of nearly the same proportion and drive, they have been able to mill locomotive rods at a feed of about 8 in. a minute when taking cuts from $\frac{3}{8}$ to $\frac{1}{2}$ in. deep and from 14 to 18 in. wide, and to channel two rods simultaneously, each channel being $3\frac{1}{2}$ in. wide and $1\frac{3}{4}$ in. deep, the feed in this case being $2\frac{1}{2}$ in. per minute.

It is to be noted that from the two examples given that the rating of the machine by pounds of metal removed for a given time or the number of cubic inches of metal removed might be erroneous and misleading, as the stress under which machines operate when taking very deep cuts is much greater than when taking slabbing cuts, as much more power is consumed. In making recommendations of types and power of milling machines, the builder, therefore, first endeavors to learn the nature of the materials to be cut, and when the metal to be worked is steel, the carbon content and

fuel and ore is obtained in the mountains, close to the furnace site. The charcoal plant consists of light retorts, each producing 1700 lb. in 24 hours, and the by-products are saved. H. H. Noble, president of the company, announced that five additional furnaces would be built similar to the one now in operation. This furnace was started on its present run July 10. Among the members of the party were S. T. Wellman, Cleveland, and the following from San Francisco: Patrick Noble, Pacific Rolling Mills Company; R. S. Moore, Moore & Scott Iron Works; F. E. Neitzel, Union Iron Works; S. P. Mooney, John A. Roebling's Sons Company; Charles M. Gunn, Columbia Steel Company (Portland and San Francisco); Richard B. Carr, Carnegie Steel Company; Edward J. Schneider, American Bridge Company.

The Lebanon Valley Iron & Steel Company, Lebanon, Pa., has added a department for the manufacture of railroad and other spikes. This department has been fully equipped and the machines were started July 27. The daily capacity of the department is about 25 tons of all kinds of spikes. The New York office of the company is at 90 West street.

The Ideal Alternators

Special Features in the Design of a Small Machine

Although probably 90 per cent. of the alternators used in power plants and factories are of less than 200-kw. capacity, it is seldom that sufficient attention is given to the characteristics of small machines by the ordinary purchaser. The larger machines are as a rule usually purchased under rigid guarantees as to regulation, efficiency, wave form, &c., but the small buyer is apt to take the first machine offered, although the wrong type of generator may waste its first cost many times over during a year.

One of the most important things to take into consideration in the purchase of an alternator is the wave form. Practically all engineering calculations and the design of recording instruments, motors, transformers, &c., are based on the assumption that the generator delivers a wave of approximately sine form, and any

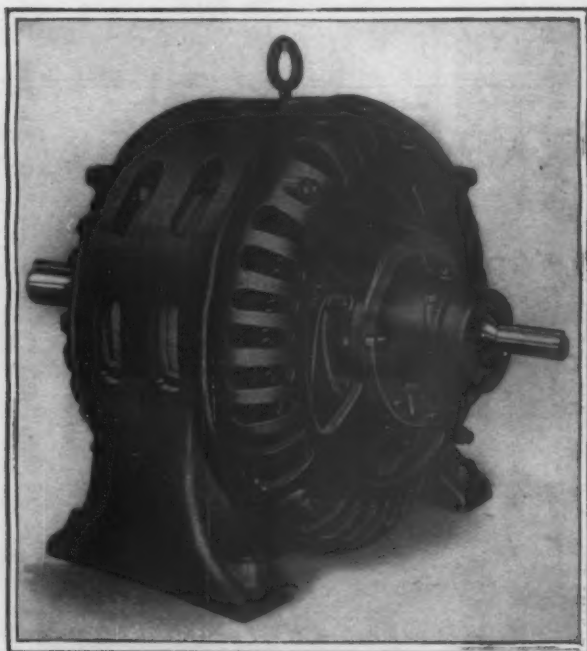


Fig. 1.—The Ideal 100-KVA. Revolving Field Alternator, Built by the Ideal Electric & Mfg. Company, Mansfield, Ohio.

variation from this shape is of great importance. Take transformers, for instance, which are computed for sine wave operation and designed to operate on a certain temperature rise for a given load. It may be that, when the transformer is put in operation, it runs hot even at no load and showing excessive iron losses. The trouble may not be due to any defect in the transformer, but may be caused by a flat voltage curve, necessitating a peaked magnetic curve in the transformer and, therefore, a high maximum induction. The transformer manufacturer could not be held legally responsible for the apparent defect, inasmuch as the apparatus was designed for a sine wave.

Another circumstance where the wave form plays an important part is when two or more alternators are run in parallel, or when an alternator supplies power for a synchronous motor. The two machines will not work satisfactorily unless the voltage wave forms of all are very nearly sinusoidal. Distorted wave forms cause large equalizing currents to flow, disturbing the normal operation, causing hunting, and spoiling the regulation, to say nothing of the excessive heating which results.

The wave form depends to a large extent upon the number of coils per phase per pole. In building small machines some manufacturers place only one or two conductors per phase per pole. This arrangement gives a very peaked wave form and also in passing from zero



Fig. 2.—Stator of the Ideal Alternator.

to the maximum, the electromotive force does not go through uniform changes, but has humps in it.

The Ideal Electric & Mfg. Company, Mansfield, Ohio, has recently placed on the market a line of revolving field alternators built in sizes from 20 to 200 kva., two and three phase for various voltages and frequencies in which special consideration has been given to the production of a uniform sinusoidal wave form. Fig. 1 shows the 100-kva. three-phase 60-cycle 2300-volt model assembled, Figs. 2 and 3 the stator and rotor, respectively, while Fig. 4 shows a series of curves which were obtained from a test of the machine.

In the stator shown in Fig. 2 it will be noticed that there are a comparatively large number of slots. Even in the smaller sizes these generators have at least three slots per phase per pole in three-phase generators, or four slots in two-phase generators, while in the larger sizes the number of slots is greater. Besides giving more conductors per phase per pole, a large number of slots also has the further advantage that it gives a more even distribution of the flux. This is especially important in small alternators having open slots. Open slots are used in the generator shown, thus permitting the coils to be form wound and heavily insulated before insertion in the armature. It also has the advantage that in case of a burn out coils can be easily removed without disturbing the remainder of the winding.

Another cause of poor wave form is the shape of the field pole pieces. The lines of force naturally pass from pole to pole through the path of least reluctance, and as the pole tips present the shortest path, the flux will concentrate here, giving an excessive magnetic

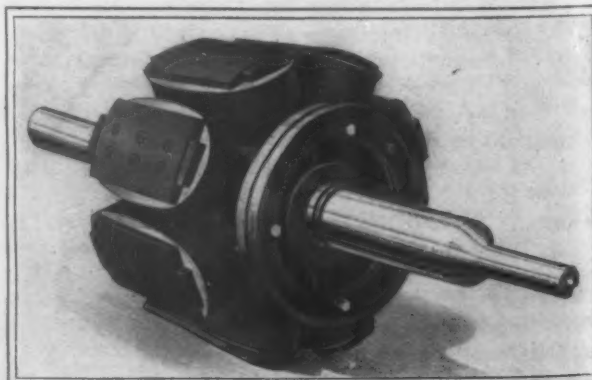


Fig. 3.—Rotor of the Ideal Alternator.

density, unless special pains are taken to prevent this by shaping the pole pieces as shown in Fig. 3. This arrangement gives a practically uniform magnetic path and insures an even distribution of the flux in the pole face at all times.

Another important feature in the design of the alternator illustrated is the fact that both bearing boxes are directly bolted to the stator frame. The bearings themselves are of the split, ring oiled, self-aligning type which offers a considerable advantage to the user in case it is necessary to remove the rotor for dismantling or making repairs. The oil is contained in large reservoirs having outside gauges to indicate the amount of oil present.

These alternators are designed for continuous operation at 80 per cent. power factor, but their ratings are given on the kva. basis at 100 per cent. power factor. By the use of carefully annealed and japanned laminations in the armature and by a liberal use of copper this machine has been so improved that it gives high efficiencies over a wide range of load. For instance, Fig. 4, which gives the test curves of a 100-kva. three-phase 60-cycle 2300-volt revolving field alternator shows that the efficiency from 50 to 125 per cent. load is practically flat, giving a maximum efficiency of 95 per cent. at full load. These curves also show the influence

in which they are placed, and should fit the crucible almost as snugly as a cartridge fits a gun barrel. Although this press is designed primarily for packing sheet and wire brass and copper scrap, at the same time it is said to be capable of turning equally well



The Champion Crucible Charge Packer, Made by the Famous Mfg. Company, East Chicago, Ind.

formed charges of sheet steel and similar scrap, which is much harder to work.

As will be noticed from the engraving, the press is self-contained and may be placed anywhere that the scrap may be. It does not have to be placed on a floor or fastened down, so that it is always ready to work. Levers are provided on both sides, so that it may be operated by either one or two persons.

The press is built entirely of steel to resist the great strains to which it is subjected in forming crucible charges. The power shaft is heavy, and is provided with substantial bearings, which form a part of the main frame of the press. A double toggle cam is located on the shaft between the boxes, which in turn are connected by wrought steel pinions to the gripper working on the square wrought steel rammer bar. Sockets are provided at each end of the shaft outside the main frame boxes for the handles. The gripper is inlaid with square high carbon tool steel to insure the edges standing up and gripping the wrought steel rammer bar.

In operating the packer the top is raised and the rammer drawn back. The pressing trough is then filled with scrap, as in the accompanying illustration. Closing the cover forces the scrap down, so that the top with the roller cam lever can be forced down in place and locked. A few strokes of the lever passes the rammer ahead, condensing and pressing the charge until it assumes the shape of those shown in front of the packer. The top is then raised and the ram drawn back. Applying pressure to the foot lever at the left forces the charge up, so that it is readily removed.

The action of the packer in operation is such that the scrap is held together without any ties, and there is practically no expansion when it is removed from the press. The charge fits the crucible snugly at the bottom, but leaves some space around the top to be filled in with borings, lathe cuttings or scrap of the kind to make the mixture of the desired character. The capacity of the machine varies with the size of the press and also with the material being pressed. If the scrap is such as will readily fill the pressure trough there is a greater tonnage output than when the scrap hangs together, and is such as requires more time in filling the trough. The press does its part of the work, it is said, in a few seconds, so that if the persons operating it work fairly fast the output per day will be from 2 to 4 tons. Two sizes of press are built, one making crucible charges 6 in. in diameter, and the other making them 2 in. larger.

The blast furnace of the Ivanhoe Furnace Company, Ivanhoe, Va., was blown out for relining July 14, after a blast of 27 months.

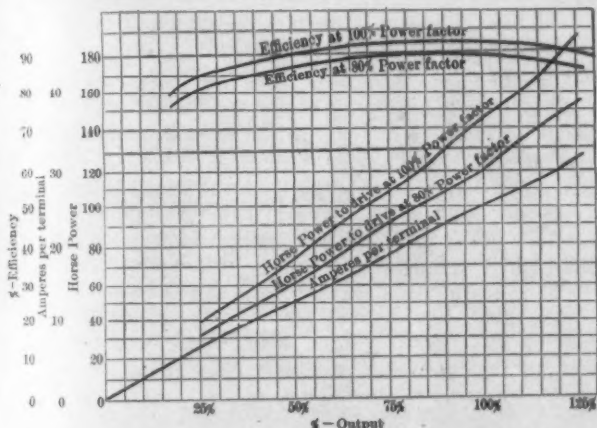


Fig. 4.—Test Curves of an Ideal 100-KVA. Three-Phase 60-Cycle 2300-Volt Alternator.

of power factor on the power necessary to run the generators. These machines run at full rated load and not less than 80 per cent. power factor without showing a temperature rise of more than 40 degrees C.

The Champion Scrap Crucible Charge Packer

For a number of years the Famous Mfg. Company, East Chicago, Ind., has been manufacturing a line of baling presses for handling every kind of balable and packable material. One of this line was a sheet and wrought metal scrap busheling press, used very extensively in stamping works, by manufacturers of household utensils and pressed metals, in rolling mills and scrap yards for packing and busheling scrap. In response to a demand from the users of this busheling press for a hand power machine to press brass and copper scrap into crucible charges instead of pounding the scrap into a half keg or similar shaped receptable, the company has developed and brought out the Champion hand power crucible charge packing press, which is illustrated herewith.

This press is intended for use in connection with brass foundries and junk dealers, and wherever it is desired to put up old brass and copper articles and wire scrap in the proper shape to fit into melting crucibles. The cross section of these crucibles is round, and, in order to secure economical melting, the charges should be in the form of a roll of approximately the same length and diameter as the crucible

Drilling Large Holes in Concrete

29-In. Bores Produced with a Chilled-Shot Drill

The core drill and its use in connection with exploratory work in mining is well known in that industry, but among those acquainted with its uses few thus far have given any consideration to it as a device through whose agency present ventilating conditions may be improved and the life of the workers protected. The engravings reproduced herewith show what has been accomplished in the way of drilling holes large enough to admit the passage of a human being through them, and perhaps point the way to what may be a very reasonable method of ventilating coal mines as well as providing additional openings to and from them. Work recently performed by the Engineer Corps of the War Department with a Terry core drill, built by the Terry Core Drill Company, 50 Church street, New York City, has established beyond doubt the practicability of drilling bore holes 30 to 40 in. in diameter vertically or at an angle and to any reasonable depth with drills of the chilled shot type. The drill used was of the maker's class D type equipped with tools for boring a 29-in. hole, and is shown in Fig. 1. A graphical demonstration of the work mentioned is given by the other two illustrations of which Fig. 2 is a view looking down into the hole and Fig. 3 shows the cores removed from it.

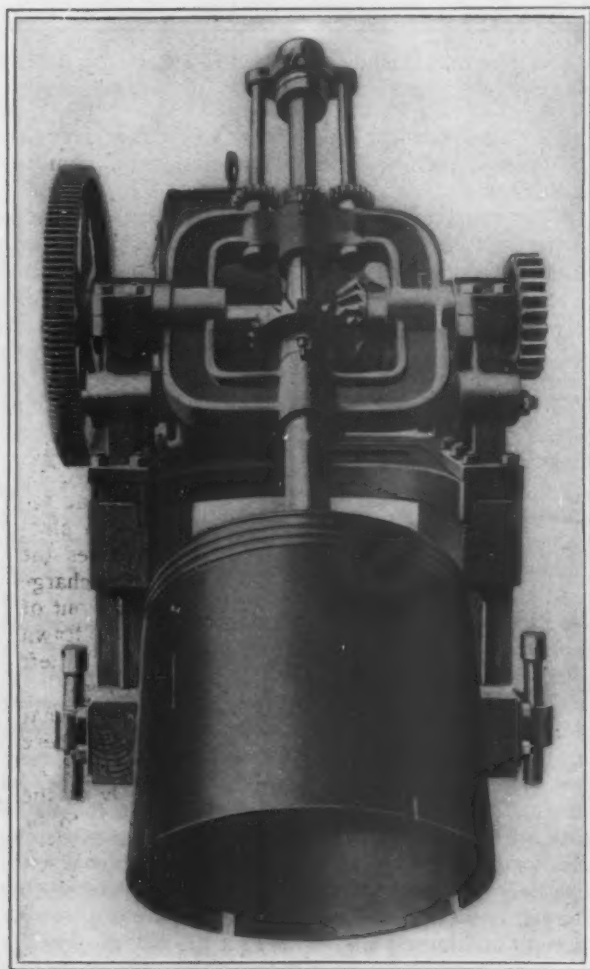


Fig. 1.—Class D Core Drill, Built by the Terry Core Drill Company, New York City.

The work was done in New York, and the material bored through was a trap rock concrete embankment. Some of the drilling was done in places where the bore holes penetrated concrete reinforced by steel beams, and elsewhere iron drain pipes and the like intersected the line of the bore hole. In one of these cores there is embedded a section of an 8-in. I-beam and in another an iron pipe 2 in. in diameter. Both the steel beam and

iron pipe were severed without any appreciable reduction in the speed of cutting. All of the holes drilled were at an angle of 55 degrees from the vertical and the average cutting rate was 2 ft. per hour. The wear on the bit was $\frac{1}{4}$ in. per foot, and 10 lb. of shot was used in drilling the same distance. Numerous seams and openings caused by imperfect setting of the cement, as well as severed pipes large enough to drain the water



Fig. 2.—View Looking Into the 29-In. Hole.

from an ordinary bore hole in a few minutes offered not the slightest hindrance to the work. Irregular and broken formations are of no consequence in drilling large holes, as has been demonstrated in similar operations. The detritus or sludge from the kerf is sufficient to close all save large seams or crevices and through which the heavy tools advance with remarkable rapidity under a high momentum.

The machine used was of the maker's class D type and the drill was rotated by an electric motor at a speed of 125 rev. per min., which gave a peripheral speed to the 28-in. bit of about 1000 ft. per minute. The feed was by hand through two feed screws at the rear of the drill head.

The speed at which the work was done is given in the following table:

| Date. | Depth drilled, Inches. | Net drilling time, Hr. Min. |
|---------------|--------------------------------------|-----------------------------|
| April 18..... | 37 | 2 40 |
| April 19..... | 36 | 1 0 |
| April 20..... | 31 | 2 0 |
| | 8-in. steel I-beam cut through. | |
| April 22..... | 33½ | 1 15 |
| | 2-in. wrought iron pipe cut through. | |
| Totals..... | 137½ | 6 55 |

The head room where the drilling was done was an extremely limited, thus restricting the drilling to short cores, which made the work much slower than it would have been otherwise. In the above table only the actual time when the drill was cutting is given, and the total running time on each of the four days listed was much greater, due to many delays for different reasons which continually occurred in the work.

For drilling the holes given in the above table it is estimated that in cutting 14 ft. of hole the wear of the bit was \$5.25 and the consumption of oil, waste, grease and shot \$2, making the total cost for 14 ft. \$7.25. In cutting a similar hole only 6 ft. in length the total cost was estimated at \$7 divided between wear on the bit valued at \$6, and consumption of shot, oil, waste, &c., at \$1. The total cost for drilling 20 ft. of hole is therefore \$14.25.

If the production of holes 30 in. in diameter and larger proves as readily feasible in general practice as it was found to be in this case, a large number of uses for this class of drilling holes ought to develop. Shot drilling has been successfully carried out in sinking cylinder holes for plunger elevators where the maximum diameter was approximately 20 in. These are

of course true vertical holes which is a trifle different problem from inclined ones.

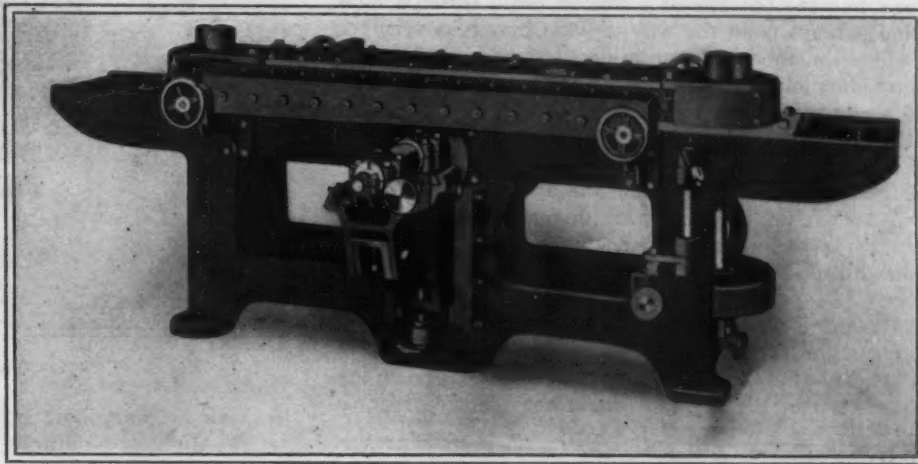
In mining operations where the head room will permit, these drills can be profitably employed for sinking winzes or boring holes for use as ore chutes, and such operations are now being conducted with a Terry drill in a large mine in northern New York. For ventilating mines several holes of 30 in. in diameter or larger can be drilled for the cost of sinking a single shaft, and if properly located these would furnish a circulation of air to the workings which is claimed to be much better than that now obtained through the shaft method of ventilation. The size of these holes would be ample for the installation of permanent ladders to serve as exits from the workings in case of accident and be of assistance in rescue work.

There would also be much less difficulty in reaching and extinguishing mine fires which under present conditions are often so located that the affected points are inaccessible and continue unmolested until checked at some place remote from their origin. To be able to reach a fire quickly while it is still in the incipient stage would save the sums hitherto wasted for lack of a vantage point from which to begin the attack. Aside from providing a means of ingress and egress for the miners, these large bore holes would supply a wholesome atmosphere to the workers under more natural conditions than is at present provided. At each opening an electrically driven fan could

attended by the general manager of sales and by sales managers from the various cities in which the companies have sales offices.

The Fay & Egan Glue Jointer

A continuous feed glue jointer for both inside finish work and furniture is one of the latest machines built by the J. A. Fay & Egan Company, Cincinnati, Ohio. It is claimed to make a glue joint better, faster and more perfectly than has ever been done before on a machine of this style, and is especially recommended



Glue Jointer for Inside Finish and Furniture Work, Built by the J. A. Fay & Egan Company, Cincinnati, Ohio.

by the manufacturer for all work where a perfect joint is desired, such as interior building trim, furniture, cabinet, piano, and other similar lines.

The machine, which is illustrated herewith, works material from $\frac{1}{4}$ to 3 in. thick, from 1 in. wide up to any width, and from 6 in. up to any length desired. The frame is absolutely rigid, and is cast open in one piece. All parts are accessible, and all bearings are oiled from the outside. The cutter heads are located one on either side of the center of the machine and run longitudinally. They are mounted in heavy housings, having vertical, horizontal and angular adjustments. The feed consists of an endless chain driven by a three-step clutch cone, operated by a lever close at hand. The power for feeding the work is transmitted by large bronze worm wheel and a steel worm running in oil, the end thrust of the worm being taken by ball bearings. The chain is of flat links with knurled faces, and all links are interchangeable, as the pins are not riveted and are thus readily removable. The chain runs over two octagonal wheels, one at each end of the machine. It is adjustable for making spring joints—that is, joints slightly hollowed on long material to insure against opening at the ends.

Materials varying $\frac{1}{2}$ in. in thickness may be worked without adjustment of the pressure bars, which are made up of a double series of knurled steel rollers, each mounted in independent housings and backed up by steel springs. Thus pieces of uneven thickness may be fed one after the other. The countershaft has both a tight and loose pulley each 12 x $5\frac{1}{2}$ in.

The floor space required for the regular style of the above machine is 8 ft. 10 in. x 5 ft. 9 in., and with an extended table and adjustable rest it requires 14 ft. x 5 ft. 9 in.

The Galesburg Coulter-Disc Company, Galesburg, Ill., is contemplating the erection of a plant for the manufacture of plow steel in the vicinity of Chicago, and will be in the market for open hearth steel works equipment, rolling mill machinery, engines, boilers, shearing machinery, &c.

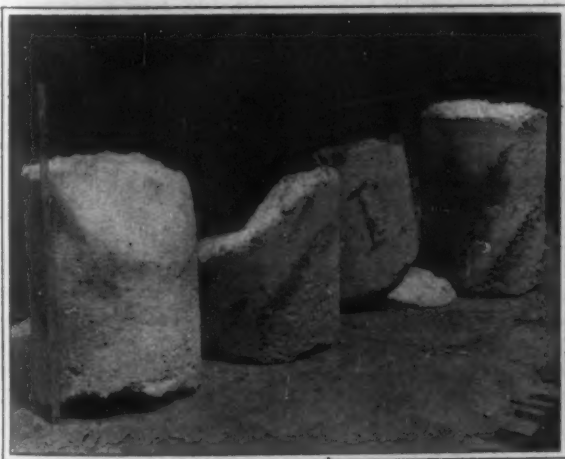


Fig. 3.—Four of the Cores Removed from the Hole.

be installed which would force fresh air into the workings or exhaust the foul air from the mine as occasion arose. Ventilation would not be the only purpose for which these bore holes could be advantageously used, as they could serve as conductors for pipes and cables and would in many cases shorten the distance to which such lines must be carried.

The annual meeting of the sales agents of the Pennsylvania Steel Company and the Maryland Steel Company was held recently in connection with visits to the plants at Steelton, Pa., and Sparrows Point, Md. The meeting was held at the office of the Pennsylvania Steel Company at Steelton, Tuesday and Wednesday, July 19 and 20, and at the office of the Maryland Steel Company at Sparrows Point Thursday, July 21. It was

Utilizing Waste Heat from Gas Engine Plants*

The Recovery of Thermal Units Now Lost in Jacket Water and Exhaust

JOHN T. FAIG.†

The designer of steam plants finds a wide variety of auxiliaries in the market. Open and closed feed water heaters, surface, jet and barometric condensers, steam heating and drying coils, cooling towers for water and water softening plants of many types are available. From these he may select elements which will give the most desirable combination for the particular problem he has to solve. The use of auxiliary machinery is familiar not only to designers of steam plants and builders of steam machinery, but to many power users and the large body of operating engineers.

In many cases the installation of such auxiliaries makes possible a higher net economy than can be obtained with internal combustion engines without auxiliaries, notwithstanding the higher thermal efficiency of the latter engines. This is particularly true of large office buildings, where the exhaust steam may be used for heating, and factories, where it may be used for heating or industrial purposes requiring low pressure steam or hot water.

Two sources of great heat waste occur in internal combustion engines. This waste is so common that there is danger of losing sight of its importance. The two sources are the jacket water and the exhaust. The amount of heat so lost varies in different engines, but

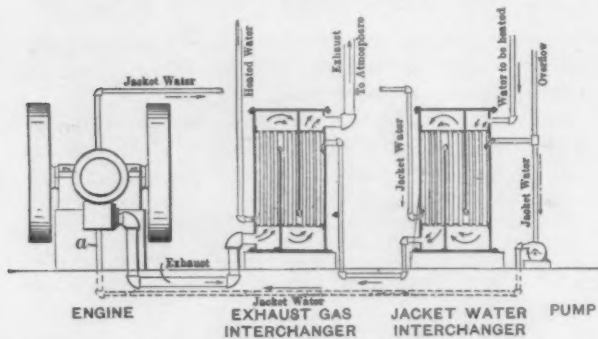


Fig. 1.—Gas Engine With Interchanger Utilizing Jacket Water and Exhaust Gases to Heat Water.

is nearly always three times as great as the amount converted into work in the cylinder.

The following table shows the percentages of heat of the fuel lost in some engines:

| Fuel. | Name of engine. | Rated h.p. | Heat converted into water in cylinder, %. | Heat lost in jacket water, exhaust and radiation, %. | Reference |
|-------------|-----------------|------------|---|--|---|
| Illum. gas. | Gueldner... | 20 | 42.7 | 57.3 | Test by Schroeter. Z. d. y. d. I. 1904. |
| Nat. gas. | Walrath... | 75 | 27.1 | 72.9 | Geer and Venelain. Sib. Coll. Thesis, 1902. |
| Prod. gas. | R. D. Wood. | 300 | 24.4 | 75.6 | Goldsmith and Hartwig. Sib. Coll. Thesis, 1905. |
| Kerosene. | Hornsby... | 25 | 21 | 79 | Robinson, 1908. Gas and Pet. Eng., p. 710. |
| Prod. gas. | Fair, Morse. | 25 | 25.8 | 74.2 | Jahnke. Univ. Cln. Thesis, 1910. |

Except for the Gueldner engine, which gave such remarkable economy as to be exceptional, the tests showed that about one-fourth of the heat of the fuel was represented by the indicated horsepower. Practically all the remaining three-fourths of the heat of

the fuel was lost in the jacket water and exhaust. As these tests were made on engines in good condition, and were considered good enough to go on record, there can be no doubt that the losses of heat in the jacket water and exhaust for every-day engines will be considerably greater. Besides the losses already mentioned, there may be mentioned the mechanical friction of the engine and the radiation, which are inevitable, and constitute together not more than 5 per cent. of the heat of the fuel. The mechanical friction is, of course, included in the indicated horsepower.

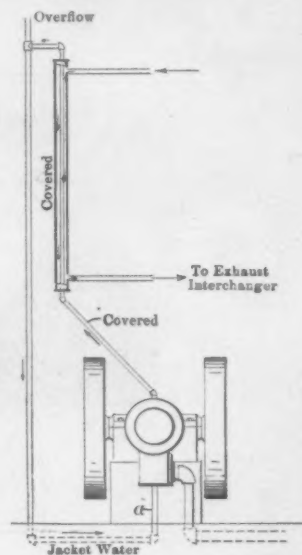


Fig. 2.—Alternative Method of Utilizing Waste Heat.

where the exhaust is used. Where hot water for heating or industrial purposes is required the utilization of most of this waste heat presents no great difficulty. Fig. 1 represents a diagrammatic sketch of an engine with two simple heat interchangers, one using the jacket water and the other the exhaust gases.

The sketch is purely diagrammatic, to show the circulation of the jacket water, exhaust gases and water to be heated through the interchangers. The same idea may be expressed in many different designs. There is no reason why one interchanger should not be placed on top of the other, or the two combined in the same shell. One form of interchanger has recently been put upon the market. Some firms use part of the heat of the exhaust for vaporization of water for the producer. The writer has given some attention to the utilization of waste heat from producer engine plants and prepared sketches for a plant utilizing practically all of the heat in the coal, except the inevitable losses of hot ash, mechanical friction and radiation, all of which may be reduced to very small percentages of the total. These sketches will not be presented at this time, as they would apply only to producer plants, while the sketches shown apply to all plants using internal combustion engines.

The interchangers may be of the simplest construction, since all pressures are small and temperatures comparatively low, the highest being that of the exhaust gases, from 600 to 1000 degrees F. A thermostatic valve could be installed at *a* to automatically admit cold water from the city mains should the temperature at *a* rise too high. This might occur if for any reason the circulation of the water being heated should be stopped. The exhaust gas interchanger should form an excellent muffler. The exhaust pipe between the engine and interchanger should be covered to reduce heat loss, maintain a reasonable temperature near the engine and prevent burnt hands.

Fig. 2 shows an arrangement which does away with the necessity for a circulating pump in the jacket water line. A thermostat controls the admission of

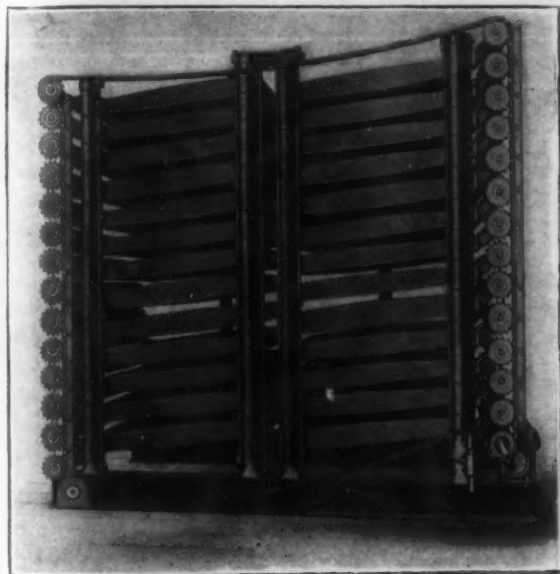
* Paper read before the National Gas and Gasoline Engine Trades Association, Cincinnati, June 15, 1910.

† Professor of Mechanical Engineering, University of Cincinnati, Cincinnati, Ohio.

cold water to the jacket water line and will operate if for any reason the interchanger does not absorb sufficient heat from the jacket water. The jacket water interchanger may be secured against a wall overhead to save space if there is sufficient head room. The height which will give the proper circulation for a given engine could probably be determined only by trial.

A New Type of Chain Drive

A scheme which has been recently patented for driving a series of parallel shafts or rolls is now being used with considerable success on cell driers for drying textiles, pulp and paper. One of the claims made by the manufacturer for the new drive, which employs a roller chain and sprockets, is that it is much more efficient in transmitting power to many rolls or shafts than the trains of spur gears and the bevel gear drives formerly used. As will be noticed from the illustration, the drive has a set of rolls for each tray, the number varying with the size of drying units from six on the



A Stack of Drying Rolls Driven by Diamond Roller Chain, Made by the Diamond Chain & Mfg. Company, Indianapolis, Ind.

smallest to 40 on the largest machines. A single loop of 1½-in. pitch Diamond roller chain made by the Diamond Chain & Mfg. Company, Indianapolis, Ind., runs around the machine and meshes with a sprocket on each roll.

The sprocket on the lowest roll at the right is the driver on the machine illustrated and turns in a clockwise direction. The chain is kept in contact with the sprockets by two steel guide rails, one on each side of the machine. The width of these rails is slightly less than that of the chain rollers, and consequently the chain is compelled to mesh with the sprockets. The lower strand of the chain runs loose, and at the left of the driving sprocket an idler is provided which is adjustable vertically to take up the slack.

The bevel gears and spur gear trains that formerly drove the rolls consumed considerable power and were noisy at high speeds. The chain is said to be much quieter and absorbs little power in overcoming the friction load. A ½-hp. motor using a 1-in. belt will easily drive an empty machine of the size shown at high speed, and this is the means employed to limber up new machines. Other advantages claimed for the chain drive are a lower initial cost, less expensive maintenance and less wear in use than the gears formerly employed.

Joseph T. Ryerson & Son, Chicago, recently sold to the Indiana Steel Company a large friction saw, to be

installed in the merchant mill at Gary. This is the second Ryerson saw of this type to be installed in the Gary Works. The large multiple punch illustrated on page 111 of *The Iron Age* of July 14, which was built by the Cleveland Punch & Shear Works Company, Cleveland, Ohio, was sold to the Pressed Steel Car Company, Pittsburgh, Pa., by Joseph T. Ryerson & Son.

The Movement of Lake Superior Iron Ores in 1909

John Birkinbine, Philadelphia, has prepared for the U. S. Geological Survey a very interesting map, with brief explanatory text in an accompanying pamphlet, showing graphically the movement of Lake Superior ores in 1909. A similar exhibit was prepared in 1903. The scheme of the map is to show by a series of red lines which originate with the various Lake Superior ranges and extend down the lakes in a broad band, from which in turn certain lines separate themselves as the lower lake ports of delivery are reached from these. In the 1902 map each of the main lines represented 1,000,000 tons, but the total shipments that year were 27,500,000 gross tons. For 1909 the total was 42,500,000 tons, and heavy lines were used, each of which represented 5,000,000 tons, while lighter lines represented 1,000,000 tons and a dotted line less than 1,000,000 tons. The pamphlet thus briefly sketches the sources of lake ores and their flow into the districts of consumption:

At the west end of Lake Superior water shipments, amounting to 29,200,000 gross tons, coming from the Mesaba and Vermilion ranges, were made from Two Harbors and Duluth, Minn., and Superior, Wis. These were augmented to 33,000,000 tons by the addition of 3,800,000 tons from the Gogebie range forwarded from Ashland, Wis., and were still further increased to 35,900,000 tons by shipments from the Marquette range, via Marquette, Mich., and by a small quantity from the Michipicoten range in Canada.

With the exception of a comparatively small tonnage required for local blast furnaces, this immense quantity passed through the Sault Ste. Marie canals and moved on to the Straits of Mackinac, where a part of the ore from the Lake Superior ports, together with some ore from the port of Escanaba (the point of shipment both for the Menominee range ores and for part of the Marquette range ores), proceeded down Lake Michigan to various ports, such as Milwaukee, Fruitport, Chicago and Gary. Some of the furnaces at these ports also obtain considerable ore from local mines in Wisconsin. The remainder of the ore from Escanaba passed eastward through the Straits of Mackinac and, with the shipments from Moose Mountain, Ont., joined the main column through Lake Huron, some being disposed of at Midland, Ont., and Detroit, Mich., but the great bulk being distributed to the lower lake receiving docks at Toledo, Sandusky, Huron, Lorain, Cleveland, Fairport, Ashtabula and Conneaut, Ohio; Erie, Pa., and Buffalo and Tonawanda, N. Y.

Most of the iron ore handled at lower lake ports is consumed in eastern Ohio and western Pennsylvania, about 23,000,000 tons being sent in 1909 to the region tributary to Cleveland and Pittsburgh. Ore is also delivered to central Ohio and to points along the Ohio River. At Buffalo and Tonawanda, N. Y., 5,000,000 tons was received, mostly for local use, although some of this was distributed by long rail hauls.

St. Louis, Mo., received a small quantity of Lake Superior ore by all-rail routes; about 80,000 tons went to Virginia; approximately 2,000,000 tons went to western Pennsylvania; and about 800,000 tons were carried to eastern Pennsylvania and New Jersey in competition with local and foreign ores, with which they are mixed. A cargo of lake ore was carried to Cape Breton, and small shipments for special purposes reached New England and the Southern States.

The pamphlet refers in conclusion to the transportation and distribution of the 20 per cent. of the ores of the United States not produced on Lake Superior. It is noted that from Lake Champlain mines about 15,000 tons went to Canada in 1909 and that some limonite from eastern Texas was delivered last year at Alabama blast furnaces. The bulk of the ore supply for the Colorado Fuel & Iron Company's furnaces at Pueblo, Colo., is brought 350 miles from eastern Wyoming, and this is supplemented by ore hauled over 600 miles from northern New Mexico. The foreign ores imported in 1909 aggregated 1,700,000 gross tons.

Autogenous Welding Equipments Compared

A Discussion of the Relative Merits of the High and Low Pressure Systems

BY HENRY CAVE, SPRINGFIELD, MASS.

There are two distinct systems of autogenous welding with the oxy-acetylene torch in use in this country, which are known as the high and the low pressure systems respectively. There is considerable discussion regarding the advantages of the so-called high pressure system among those who are interested in this process, but very few people really know wherein these advantages lay. What is called the high pressure system in this country is really the medium pressure system of France, wherein the different systems were mainly developed, the real high pressure system not having been introduced into this country.

The Low Pressure Torch

The low pressure system is generally considered as embracing those using acetylene at the pressure usually generated by the common acetylene lighting generator in use in this country, which is limited to a maximum pressure of about 10 oz. per square inch, which is only

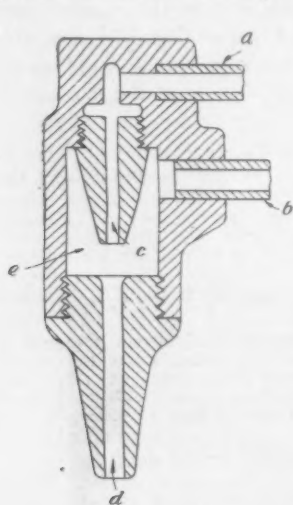


Fig. 1.—Low Pressure Torch.

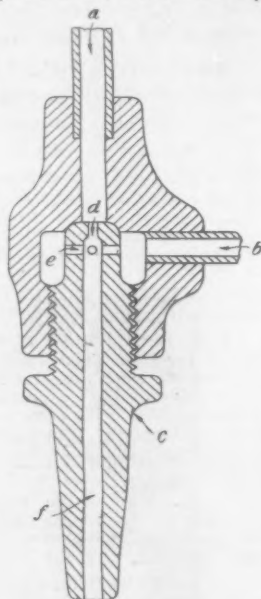


Fig. 2.—High Pressure Torch.

Sections of the Two Types of Torches Employed in Welding.

enough to force the acetylene through the piping to the chamber at the tip or burner of the torch. From this chamber the acetylene is drawn into the oxygen by the vacuum produced by the flow of the latter under a high pressure, or by what is termed injector action, as this is the principle on which boiler feed injectors work. This is shown diagrammatically in Fig. 1, in which *a* is the oxygen supply, *b* the acetylene supply, *c* the oxygen nozzle, *d* the mixture nozzle and *e* the acetylene chamber. The action of the gases is illustrated, the full lines representing the path of the oxygen and the dotted ones that of the acetylene.

As there is nothing to restrict the amount of acetylene drawn in, it has to be regulated by the flow of the oxygen, according to the formula for the injector where the amount of acetylene drawn in varies as the square of the velocity of the oxygen. Thus any variation in the pressure of the oxygen has a very pronounced effect on the flame. Such variations might be produced by irregular working of the oxygen reducing valve, by variations in the temperature of the tip expanding the orifice, or by particles of metal adhering to the tip, and where these variations produce

an excess of oxygen an oxidizing flame would result.

By examining the representation of the flow of gas in the low pressure torch, shown in Fig. 1, it can readily be seen that the mixture as it issues from the tip to be ignited cannot be homogeneous, as there must be an excess of oxygen in the center, and this defect

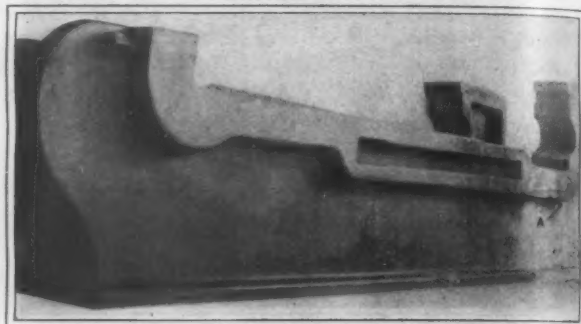


Fig. 3.—A Cracked Bulldozer Frame Repaired by Welding.

causes this type of torch to require 1.50 to 1.80 parts of oxygen for every unit of acetylene burned. The surplus oxygen combines with the metal to produce weak, brittle welds, and also prolongs the time to make the weld due to the metal being burnt up by oxidation.

The High Pressure Torch

The high pressure torch will not work with acetylene from a lighting generator, as it requires pressures varying with the size of tip used up to 15 lb. per square inch, but the acetylene may be taken from a special pressure generator or from a cylinder of dissolved acetylene and the pressure adjusted by a reducing valve similar in action to that used on the oxygen cylinder. Fig. 2 shows a section of the tip of a high pressure torch, the oxygen coming in at *a* and the acetylene at *b*. The oxygen passes into the tip *c* through the hole *d* and the acetylene through the holes *e*, the gases then passing together along the passage *f* to the end of the tip where the ignition takes place.

The acetylene coming in at the holes in the side of the tip under a pressure only slightly less than that of oxygen, the two gases meeting at right angles and passing together through the tip produces a very intimate contact of the molecules, with the result that only 1.28 parts of oxygen are used to 1 part of acety-



Fig. 4.—The Cracked Cylinder Head of a 200-Hp. Engine.

lene, which, it is stated, results in welds of maximum strength as there is a minimum of oxidation. These welds are also produced at a minimum cost, because of the reduction not only in the oxygen used, which alone produces an economy of from 25 to 40 per cent., but also in the time required to make the weld, which

is considerably shortened owing to the decreased oxidation. This latter saving on exactly the same welds has been as high as 60 per cent. The mixture depends absolutely on the sizes of the holes *d* and *e* and on the pressure under which each gas is fed to the torch. This latter being regulated by reducing valves, it is not subject to variations; the mixture is therefore positive, and as there is very little injector action the proportions are not varied materially by outside conditions.

It can therefore be seen that the advantages the high pressure torch has over the low pressure type is

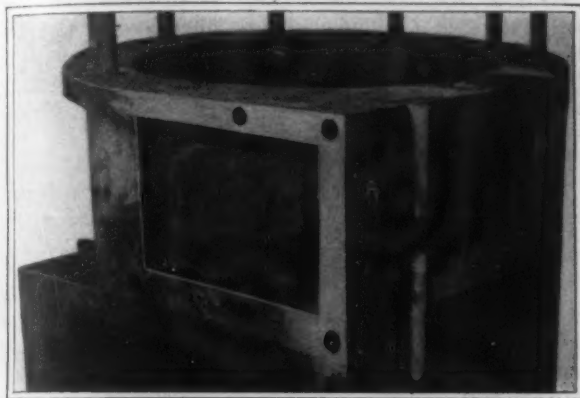


Fig. 5.—Cylinder Head Repaired by Welding in a New Piece.

not so much due to higher pressure of the acetylene, but to the fact that this high pressure enables the amount of the two gases to be regulated accurately by the holes in the tips, and that the mixture thus produced is absolutely homogeneous and results in the maximum molecular contact of the gases. The high pressure is an attendant feature of this type of torch, and the positive mixture thus obtained is the main reason for the economy. Those torches using a higher pressure than that produced by lighting generators, although they are sometimes termed high pressure, do not, without this positive feature, have the advantages of this type, but really work on the injector system with its disadvantages. It would be better to describe these torches as positive mixture and injector mixture types and then there could be no possible confusion between them.

Economic Features to Be Considered

Outside the construction of the torch, the principal economic features which should be considered are the method of producing acetylene from calcium carbide and the oxygen supply. The principal consideration in acetylene generator design is the means used to bring the water and the calcium carbide together. This is an economic consideration, because where the water is fed to the carbide a considerable separation of a part of the carbon from the gas occurs which forms tar and causes trouble by clogging up the pipes and the torches, and also considerably reducing either the calorific value of the gas or the number of cubic feet obtained per pound of carbide. This separation of the carbon is produced by the heat generated due to insufficient water to slack the carbide and produce the gas. This cannot take place in carbide feed generators in which the lumps of carbide are dropped into a tank of water, and it has been said that two cans of carbide in the latter type would go as far as three cans in the water fed model. Professor Pond's pamphlet on Calcium Carbide, which is recognized as containing the best information on this subject, states that the generators of the carbide-to-water type are undoubtedly the best, as with the water kept in excess it is impossible for the temperature to rise above the boiling point of water, and under all conditions this class of generators yields the purest gas, as the acetylene having to bubble

through the lime water formed in the generator is washed free from most of its impurities.

With regard to the oxygen, it is desirable not only to consider the price at which it can be produced or bought, but also to consider its purity and what the impurities consist of, as some are far worse than others and produce weak welds. For example, chlorine has a very bad effect on the strength of welds, and this gas generally is present in oxygen produced in small generating plants. It can, of course, be removed by washing, and it has been found that where the oxygen is generated at atmospheric pressure the molecules of the gas passing through the water offer such a large surface that this impurity is removed only by passing through 9 ft. of washing fluid. When, however, the oxygen is produced under pressure ready for use the globules would probably only offer one-tenth of the surface and should therefore pass through 10 times as much washing fluid, or 90 ft., which could be readily accomplished in a stationary generator, but would be practically impossible in a portable one.

Disadvantages of Portable Generators

It is the writer's opinion that it is impossible to produce oxygen satisfactorily in a portable generator, the only feasible way being to use cylinders charged from a stationary plant having a satisfactory washing arrangement. Another reason why portable generation of gases is not desirable is that these generators produce such a small amount of gas that on large work an additional attendant is required. For small work where portability is required, the most suitable equipment consists of dissolved acetylene and oxygen in cylinders, which can be placed on a truck if desired, although in most cases this is not necessary as the units are not heavy.

For large emergency work a small stationary acetylene generator equipment is most suitable, but no



Fig. 6.—Portion of a 22-In. Gear Where Almost an Entire Tooth Was Built Up by Welding.

advantage is gained by mounting it on a truck as it should always be emptied of both water and carbide before moving. Otherwise there would be a chance of the generator being tipped and the water and carbide coming together, with a resulting instant generation of a large amount of gas which would burst the generator or else escape into the air and become ignited.

It is doubtful if any insurance company would sanction using a portable generator equipment mounted on a truck inside buildings, and as it could not be used outside in winter without freezing, there is no legitimate use for equipments of this sort.

In speaking of the high pressure torch I have called attention to the high pressure generator. This generator must not be confused with a type employed for charging dissolved acetylene cylinders such as are used for automobiles, which generates several hundred pounds pressure and was proven very dangerous. The generator used with the high pressure torch only generates pressure up to 15 lb. per square inch, which is perfectly safe, as shown by the fact that generators of this type have been passed by the laboratory engineers of the National Board of Fire Underwriters.

Repairs Made with a Positive-Mixture Torch

The injector mixture torch becomes less economical as its capacity is increased. This is not the case with the positive mixture torch, and some very large work has been carried out with it by the Autogenous Welding Equipment Company, Springfield, Mass., which keeps an equipment crated and ready to ship to any breakdown job at any moment's notice. A number



Fig. 7.—Welding the Jars of the Edison Storage Battery, an Application of the Process to Manufacturing.

of repairs made by this company are illustrated herewith. Fig. 3 shows a bulldozer frame weighing 8 or 10 tons, made from cast iron, that was cracked at A through a section 8 in. wide by 5 in. deep. This was repaired by welding an additional inch of metal to increase the strength, making the actual weld 8 x 6 in. This machine could not have been repaired in any other way, and as a new casting could not have been obtained for several months a large financial loss was avoided by the successful welding of the break, the cost of which was small in proportion to that of a new frame.

Fig. 4 shows a break in the cylinder of a 200-hp. engine supplying the power for a factory employing 400 hands, which would have entailed a still greater loss. As there was no pattern of the casting available, making one, pouring the casting and the machining of the new cylinder would have meant a shutdown of a month or more, whereas the factory was running again on the Tuesday following the Thursday night, when the break occurred, the flange being welded back on the cylinder, as can be seen in Fig. 5.

The rim of a 12-ft. cast iron gear weighing 16 tons, whose face was 22 in. wide, broke at the rim. This was repaired by welding, the metal at the weld being 4 in. thick, and three-quarters of the tooth A, which was missing, was replaced, as shown in Fig. 6. In all 120 lb. of cast iron, the metal being added drop by drop, were required to make the weld.

Another considerable saving resulted from the welding of the crank disk of a 150-hp. steam engine which was split by the crank pin being forced too

tightly into place. It would have been necessary to remove an 18-in. belt and also the flywheel to get the shaft out, and to do this part of the engine room would have to be torn down. In this case also there was no available pattern for the disk, and the successful completion of the repair in one day saved a shutdown of some weeks and was also cheaper as the repair charges were much less than the cost of a new disk.

The autogenous welding process is coming into extensive use for manufacturing, particularly where the work can be done automatically in a machine, as is the case with a large amount of sheet metal work. A good illustration of its application to this kind of work is given in Fig. 7, which shows the welding of the Edison storage battery jar, made from nickel iron about 1-64 in. thick. The longitudinal seam and one end are welded, the contents are then assembled and the top welded in place, as shown in the engraving, the work being entirely automatic. In this way much better work, as well as cheaper, can be done than by hand.

Sydney's Aid to Shipbuilding

TORONTO, July 30, 1910.—The ratepayers of Sydney, N. S., voted favorably July 20 on the by-law submitted by the City Council providing for the grant of a free site and a bonus of \$350,000 for a steel shipbuilding plant. The by-law was submitted after some negotiation with Joseph Constant and associates of London, England, and with Constant & Hawthorne, naval architects, Montreal. The Constant interests propose to erect a steel shipbuilding plant, a repair, wrecking and salvage plant, and a floating dock. The dock will be a sectional steel pontoon, capable of docking a ship of 15,000 tons register, and will be built in the company's English yard. By adding sections the dock may at any time be converted into what is described in the act as a first-class dock. The company intends to build and sell ships. It has been said that it will sell on the installment plan. It is also the intention to prepare to build warships for the Canadian Government. Until the Dominion Steel Corporation's plate mill, now under construction, is completed, plates, angles, &c., will be imported. The company undertakes to keep from 500 to 1000 hands employed.

At the last session of the Nova Scotia Legislature an act was passed to enable the city of Sydney to give a bonus of \$50,000 and a free site to a shipbuilding company, and a guarantee of 1½ per cent. per annum on \$1,500,000 for 25 years. The company preferred the present arrangement, which is to be carried out by the city giving \$350,000 of its 4 per cent. bonds to the company and conveying a free site. The Legislature is expected to validate the altered arrangement.

As the Province has a standing offer of \$100,000 as assistance to the first large steel shipbuilding plant in Nova Scotia, and as the Dominion will pay 3½ per cent. per annum on the capital outlay for a dock, the company should be able to make a success of the venture.

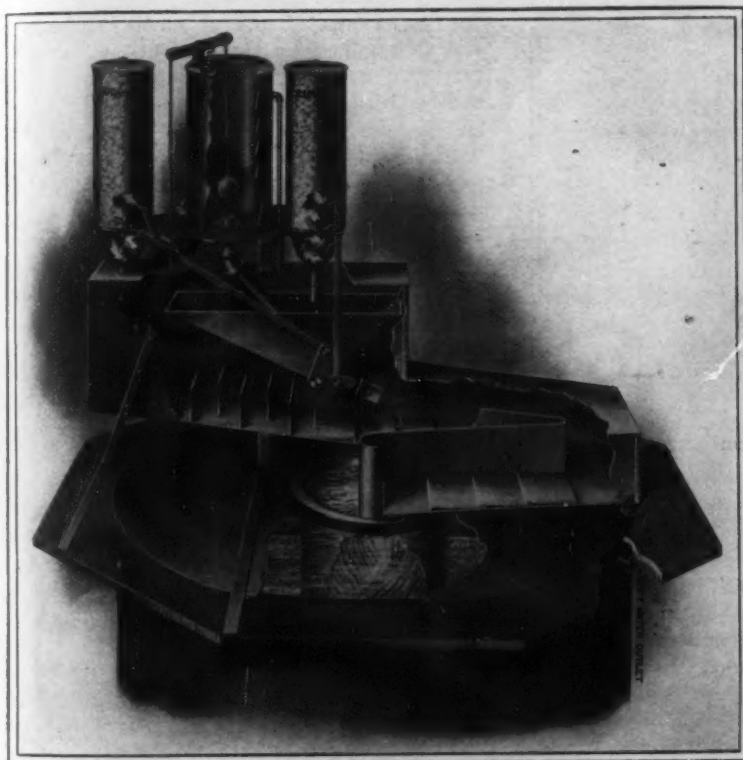
C. A. C. J.

Robert Aitchison, formerly general manager of the Aitchison Perforated Metal Company, has opened an agency office in the Plymouth Building, Chicago. He will represent in the Chicago territory the Nortmann & Duffke Foundry Company, Milwaukee, manufacturer of crucible steel, gray iron castings and pressed steel shapes, and is seeking other agencies in the mining and milling machinery lines.

The United States Radiator Corporation has secured the quarters formerly occupied by the United States Heater Company at 34 Dearborn street and 98 Lake street, where it will maintain its Chicago branch, under the management of E. A. Stark.

The Peerless Automatic Water Softening System

The special features of the Peerless system of water softening, manufactured by the Peerless Water Softener Company, Traction Terminal Building, Indianapolis, Ind., are the use of chemical reagents in a dry state instead of in a liquid solution, and the use of a few automatically operated parts. The first of these probably constitutes the most radical departure from former methods, as it differs markedly from all the known systems. In these systems the chemical reagents employed to remove the mineral impurities from the water are first converted into a liquid solution, but in the Peerless they are employed in a dry state. To deliver the exact amount of liquid reagent in a proper proportion to the flowing water is an extremely delicate task, as it is generally admitted that



The Water Softening Apparatus Built by the Peerless Water Softener Company, Indianapolis, Ind.

water containing 40 grains of impurity to the United States gallon is a bad water, although this proportion of impurity is only about one-fourth of 1 per cent. The purpose of the water softening system is to eliminate by chemical reaction about 90 per cent. of these impurities, leaving in the water about 10 per cent., or about one part in 4000. These figures show the extreme delicacy of the operation, especially when dealing with such an infinitesimal amount. It is claimed that by the Peerless system the use of the reagents in a dry state enables greater exactness to be secured in the operation.

The Peerless system in its essential features consists primarily of five component parts. The first of these, the auxiliary raw water reservoir, consists of a steel tank, into which the raw water flows, equipped with an automatic cut-off operated by a float valve. This cut-off arrests the flow of water while the weighing hopper is discharging its contents. This reservoir is the central one of the three cylindrical tanks shown in the upper part of the engraving. The two outside ones constitute the second part of the system, and are the self-measuring chemical feeders. These are composed of a chemical container equipped with an automatic self-measuring device operated, as is clearly shown, by levers from the weighing hopper, which

opens and closes the gates of the feeders. One of the chemicals used in the process is soda ash, which is discharged from the left tank directly into the sluiceway. The other is lime and is discharged into the automatic weighing hopper simultaneously with the raw water.

The automatic weighing hopper consists of a triangular steel mixing chamber, which is so constructed that when full it dumps automatically, this action furnishing the motive power to operate the automatic cut-off in the raw water reservoir and close the gates of the chemical feeders.

From the weighing hopper the water is dumped into the agitating sluiceway or breakers below. This part of the apparatus is constructed of sheet steel, with baffle plates and a series of steps, over which the water flows, thus thoroughly mixing the reagents with the raw water before it is discharged into the precipitating tank. This tank, the upper portion only of which is shown, is constructed of steel boiler plate in the form of a standpipe, with a water-tight inner tube extending from the top to within a few inches of the bottom. The water after flowing out of the sluiceway passes down through this inner tube to the bottom of the tank, and then rises in the space between the inner tube and the outer shell, passing through a filter near the top of this space and finally flowing out through the soft water outlet at the right side of the tank near the top. In this tank, as its name indicates, the impurities are precipitated out by the chemical action of the reagents and the precipitate falls to the bottom of the tank, which is conical in form and provided with a blow-off valve for the removal of this matter. This system is designed primarily for the use of industrial plants to remove the scale forming impurities present in the boiler feed water, although it can be used with equal success for rendering drinking water palatable, and at the present time a municipal design for handling large quantities of water, 6,000,000 gal. and upward every 24 hours is being made. While soda ash and lime are employed in the system described, it is of course possible to substitute any other dry chemical for one or both of these re-

agents, according to the character of the water to be treated.

The American Gas Machine Company's Enlargement.—The American Gas Machine Company, Albert Lea, Minn., is erecting a new factory building, 65 x 240 ft., five stories. The first floor will be devoted to offices and salesrooms, brass foundry and electric plating department; the second to the sheet metal department, the third to the brass furnishing and assembling department and the fourth and fifth to the shipping and stockrooms. At the present time the company employs 100 people, but as soon as the new plant is completed it will probably require double that number. The new building will be ready for occupancy about January 1. This company recently established an Eastern branch house in New York State for the more efficient handling of its large New England trade.

The Vulcan Steam Shovel Company, Toledo, Ohio, is having plans prepared by Arnold & Co., 181 La Salle street, Chicago, for the buildings of its new plant to be erected at Evansville, Ind. The dimensions of these buildings have not yet been determined.

Efficiency Tests of Centrifugal Pumps

Results Obtained from Two Large American Models

The American Well Works Company, Aurora, Ill., has just made public the report of an efficiency test

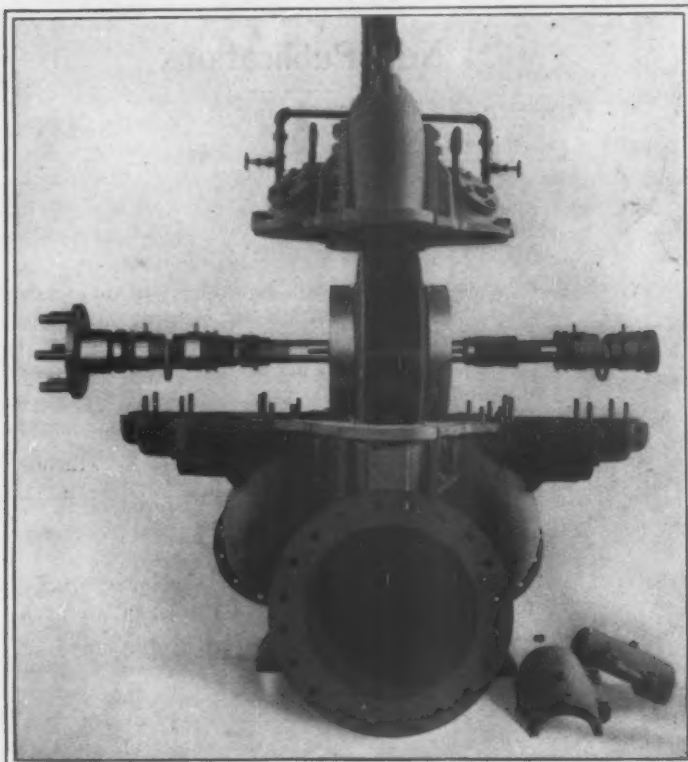


Fig. 1.—A Typical Centrifugal Pump, Built by the American Well Works, Aurora, Ill.

made on two of its centrifugal pumps. These pumps constituted part of an order for seven, which number will be ultimately increased to 15, the pumps being intended for irrigating 14,000 acres of land in the San Joaquin Valley, California. One of the pumps tested was designated by the manufacturer as a 20-in. and the other as a 15-in. pump, these dimensions being the diameter of the suction connections at the point of inlet into the main casing. In general character the pumps were identical and of the type shown in Fig. 1. The larger pump hereinafter designated as pump No. 1 has an outlet 24 in. in diameter and the double suction were each 15 in. in diameter. The corresponding dimensions of the smaller pump, hereinafter designated as pump No. 2, were 20 and 12 in., respectively. The curves obtained from the tests are shown in Figs. 2 and 3, respectively.

Both pumps were supplied with runners of the inclosed type and were operated during the test by direct connection through a flexible coupling to a jack shaft which in turn was belt driven by a direct current 125-hp. motor.

The dynamic heads were observed by mercury columns. The suction column was connected to both suction pipes on the horizontal axis of the ells, the other end of which connected direct to the pump casing. The connections were at an approximate distance of 3 ft. from the entrance to the pump runner and on the 15-in. pipe in the case of pump No. 1 and the 12-in. one in the case of pump No. 2. The force column was attached to the horizontal axis of the pump outlet immediately inside the flange, the diameters of discharge openings at points of connection being, as previously mentioned, 24 in. in the case of pump No. 1 and 20 in. in the case of pump No. 2. Necessary corrections were made to reduce the observed readings of the force column to an elevation coinciding with the horizontal axis of the pump discharge.

The quantity of water passing through the pumps was measured on a contracted weir 14 ft. long for pump No. 1 and 8 ft. in the case of pump No. 2. After some experimentation, the baffles between the pump discharge and the weir were so arranged as to secure conditions of flow suited to reasonably accurate measurement. The depth of water passing over the weir was measured in a still well by a hook gauge. The still well was connected with the basin by a pipe having three connections to the water at the bottom of the basin above the weir and distributed at substantially equal distances along its length. The zero of the hook gauge was carefully adjusted to the weir crest elevation with a Y level. A sluice gate placed immediately in front of the pump discharge afforded means for regulating the quantity of water flowing through the pump, with corresponding variations in lift.

The amount of current used by the motor was determined by measurement with a direct reading voltmeter and ammeter. The tests were run after the usual manner, commencing with the wide open discharge and working down through various stages of partial gate opening to complete closure. Some leakage in the gate, however, prevented an entire cessation of the discharge. After running a sufficient length of time to secure uniform conditions with each degree of gate opening, the various observations were made and checked.

After completing the test of both pumps in this manner a prony brake was substituted for the pump and a brake test made to determine the relation between the power applied to the pump shaft and the current supplied to the motor, the differences representing the losses in jack-shaft belt and motor.

The higher efficiency given by pump No. 2 is to be accounted for by slight error in the assembling of pump No. 1 not discovered until after the completion of the test of pump No. 2. The brass packing rings at the ends of the runner had been reversed in assembling, resulting in friction between the runner and these rings on both sides of the pump. This friction had been sufficient during the test to leave a very noticeable wear upon the rings, and as this acted as a brake

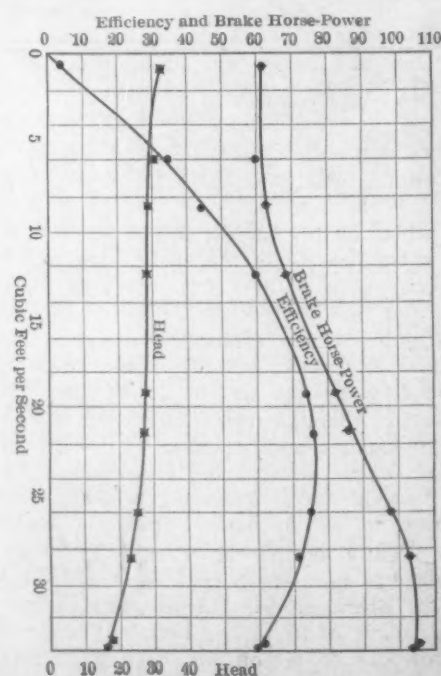


Fig. 2.—Test Curves of the 20-In. Pump.

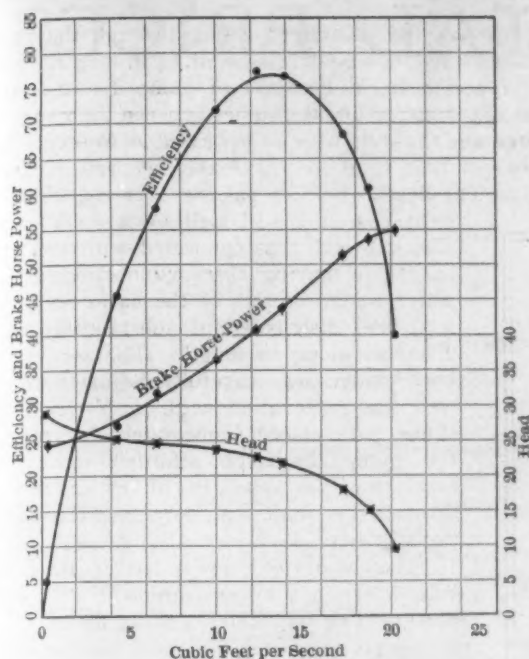
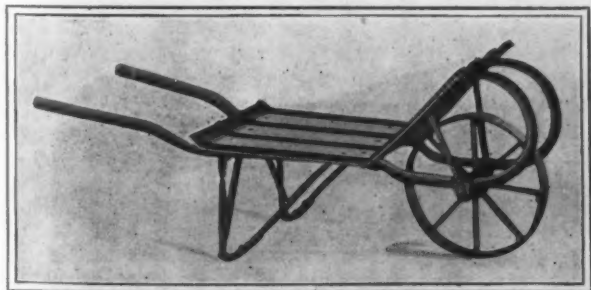


Fig. 3.—Curves Obtained from Test of the 15-In. Pump.

on a circle 20 in. in diameter, there can be little doubt if this error had not been made the pump would have shown, as it should have, as high, or somewhat higher, efficiency than pump No. 2.

The Syracuse Pig Iron Barrow

The No. 62 pig iron barrow built by the Syracuse Chilled Plow Company, Syracuse, N. Y., which is illustrated herewith, is said to possess the advantages of great strength and ease in handling. The most important part of any barrow built for handling pig iron or other heavy material is the forward end, as the load



The No. 62 Pig Iron Barrow, Made by the Syracuse Chilled Plow Company, Syracuse, N. Y.

must be carried well forward in order to bring as much weight on the wheel and as little on the handles as possible.

The wheel of this barrow, which is 17 in. in diameter, is extra heavy and the spokes are cast into the hub, which prevents them from working loose. The tire is shrunk on and the spokes riveted in place, a type of construction which results in a wheel which is said not to have any slack, and the spokes do double duty by suspending as well as supporting the hub. The wheel is set in a tubular iron frame which is a continuation of the handles, and is bent so as to form a support and guard for the wheel and also serve as a brace for the front of the tray. Referring to the engraving of the barrow, it will be noticed that this wheel guard projects slightly beyond the wheel. The operator is thus enabled to dump the barrow forward so that at the end of the operation the barrow rests on the guard with no danger of its falling back. When not in use the barrow can be set on end, resting on this wheel guard and thus saving considerable space in storage.

The handles are offset at the rear of the tray, thus providing a high support, with consequent ease in handling and balancing. The tray is made of No. 8 gauge steel and is 24 in. long, 22 in. wide and 16 in. deep at the forward end. Four straps reinforce it throughout its entire length, thus giving extra stiffness to the tray and relieving it of the wear consequent to the handling of rough, heavy material.

New Publications

Electric Power Plants. By Thomas Edward Murray, second vice-president and general manager, New York Edison Company. Pages, 337; illustrations, 152. Privately printed for distribution gratuitously among the author's friends and others who would appreciate the value of such a book.

The object of this work is to exhibit the engineering details of certain modern electric lighting and power plants which represent the most advanced design and construction. The list of plants is a fairly representative one, and includes the largest stations of the New York Edison Company in the Borough of Manhattan, the power stations of the Brooklyn Rapid Transit Company and the Gold street station of the Kings County Electric Light & Power Company, Brooklyn, N. Y.; two stations in smaller cities, one industrial power plant and one hydroelectric plant.

The two Waterside stations of the New York Edison Company exhibit not alone the installation and operation of units of exceptional size and large output, but also the many expedients required to insure continuous service throughout a large city area and the consequent meeting of every conceivable emergency. One power station of the Rapid Transit Company represents a system of high tension distribution with rotary converter substations, and is a radical departure from the earlier system of operating trolley lines by primary generation of direct current with reliance upon boosters for long distance transmission. This single large central station delivers current to any part of the system, which comprises over 300 miles of track, without excessive loss, and underground high tension feeders replace the heavy overhead cables, resulting in great flexibility and ample provision for future growth wherever this may become necessary. The other railroad station is of especial interest, as it shows the application of horizontal steam turbines as prime movers. The station of the Kings County Electric Light & Power Company is an example of the earlier engine driven station rebuilt as a turbine driven station. The other two central stations are typical installations for light and power in small cities, and the power plant of the Helderberg Cement Company illustrates an industrial plant wherein exceptional local conditions had to be met. The hydroelectric plant is that of the Chattanooga & Tennessee River Power Company, which is representative of the recent application of water power to the production of electric energy.

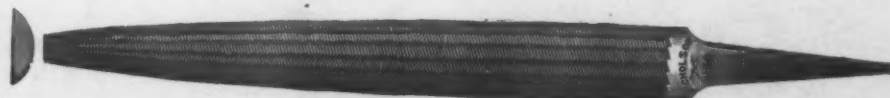
With a view to making the book of practical utility to the electrical engineer and power station builder, the author, who is also the designer of the plants described and supervised their construction, has confined himself to the exposition of facts and data valuable for purposes of comparison. He has therefore omitted all theoretical discussions, since the book is presented chiefly as a guide or collection of precedents likely to be of service to others having similar problems to solve. The illustrations include views of the stations, exterior and interior, the latter showing the apparatus installed; floor plans and sections of the various structures and diagrams of piping systems and electrical transmission lines, &c. The index is divided into sections, each of which is devoted to one of the stations, and these are also subdivided to make the locating of any particular part of one of the stations a comparatively easy matter.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

| IRON AND STEEL— Bar Iron from store— | | Genuine Iron Sheets— Galvanized. | | METALS— Tin— | |
|--|--|--|--|--|--|
| Refined Iron: | | Nos. 22 and 24 | | Straits Pig..... | |
| 1 to 1½ in. round and square..... | | No. 26..... | | Lake Ingot..... | |
| 1½ to 4 in. x ½ to 1 in..... | | No. 28..... | | Electrolytic..... | |
| Rods—½ and 11-16 round and square..... | | Corrugated Roofing— | | Casting..... | |
| Angles: | | 2½ in. corrugated..... | | Spelter— | |
| 8 in. x ¼ in. and larger..... | | No. 24..... | | Western..... | |
| 8 in. x 3-16 in. and ¼ in..... | | No. 26..... | | Zinc. | |
| 1½ to 2½ in. x ¼ in..... | | No. 28..... | | No 9, base, casks... .. | |
| 1½ to 2½ in. x 3-16 in. and thicker..... | | Tin Plates— | | Lead. | |
| 1 to 1½ in. x 3-16 in..... | | American Charcoal Plates (per box.) | | American Pig..... | |
| 1 to 1½ in. x ¼ in..... | | A.A.A. Charcoal: | | Bar..... | |
| 1½ x ¼ in..... | | IC, 14 x 20..... | | Solder. | |
| 1½ x ¼ in..... | | IX, 14 x 20..... | | No. 1, guaranteed..... | |
| 1½ x ¼ in..... | | A. Charcoal: | | No. 1..... | |
| 1½ x ¼ in..... | | IC, 14 x 20..... | | Refined..... | |
| 1½ x ¼ in..... | | IX, 14 x 20..... | | Prices of Solder indicated by private brand vary ac- | |
| 1½ x ¼ in..... | | American Coke Plates—Bessemer— | | cording to composition. | |
| 1½ x ¼ in..... | | IC, 14 x 20..... | | Antimony— | |
| 1½ x ¼ in..... | | IX, 14 x 20..... | | Cookson..... | |
| 1½ x ¼ in..... | | American Terne Plates— | | Hallett..... | |
| 1½ x ¼ in..... | | IC, 20 x 24 with an 8 lb. coating..... | | Other Brands..... | |
| 1½ x ¼ in..... | | IX, 20 x 28 with an 8 lb. coating..... | | Bismuth— | |
| 1½ x ¼ in..... | | Seamless Brass Tubes— | | Per. lb..... | |
| 1½ x ¼ in..... | | List November 13, 1908..... | | Aluminum— | |
| 1½ x ¼ in..... | | Brass Tubes, Iron Pipe Sizes— | | No. 1 Aluminum (guaranteed over 99% pure), in ingots | |
| 1½ x ¼ in..... | | List November 13, 1908..... | | for remelting..... | |
| 1½ x ¼ in..... | | Copper Tubes— | | Rods & Wire..... | |
| 1½ x ¼ in..... | | List November 13, 1908..... | | Sheets..... | |
| 1½ x ¼ in..... | | Braze Brass Tubes— | | Old Metals. | |
| 1½ x ¼ in..... | | List August 1, 1908..... | | Dealers' Purchasing Prices Paid in New York | |
| 1½ x ¼ in..... | | High Brass Rods— | | Copper, Heavy cut and crucible..... | |
| 1½ x ¼ in..... | | List August 1, 1908..... | | Copper, Heavy and Wire..... | |
| 1½ x ¼ in..... | | Roll and Sheet Brass— | | Copper, Light and Bottoms..... | |
| 1½ x ¼ in..... | | List August 1, 1908..... | | Brass, Heavy..... | |
| 1½ x ¼ in..... | | Brass Wire— | | Brass, Light..... | |
| 1½ x ¼ in..... | | List August 1, 1908..... | | Heavy Machine Composition..... | |
| 1½ x ¼ in..... | | Copper Wire— | | Clean Brass Turnings..... | |
| 1½ x ¼ in..... | | Base Price, Carload lots mill 14¢ | | Composition Turnings..... | |
| 1½ x ¼ in..... | | Copper Sheets— | | Lead, Heavy..... | |
| 1½ x ¼ in..... | | Sheet Copper Hot Rolled, 16 oz (quantity lots) | | Lead, Tea..... | |
| 1½ x ¼ in..... | | Sheet Copper Cold Rolled, 16 oz advance over Hot | | Zinc Scrap..... | |
| 1½ x ¼ in..... | | Rolled..... | | | |
| 1½ x ¼ in..... | | Sheet Copper Polished 20 in. wide and under, 1¢ | | | |
| 1½ x ¼ in..... | | square foot..... | | | |
| 1½ x ¼ in..... | | Sheet Copper Polished over 20 in. wide, 2¢ | | | |
| 1½ x ¼ in..... | | square foot..... | | | |
| 1½ x ¼ in..... | | Polished Copper, 1¢ square foot more than Polished. | | | |

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